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ABSTRACT

The final report of Specialized Office Three (S-3) of the Wisconsin Research and Development Center for Cognitive Learning describes activities for improving the quality of instruction for children with handicapping conditions, other than the deaf and blind, through media, materials, and educational technology. In Section I, the project background is reviewed; the philosophy, goals, and objectives of the project are considered; and organization of the project is outlined. Explained in Section II are S-3 activities which include entering 14,321 instructional media and materials into the National Instructional Materials Information System; the initiation of a standardized system for locating, assessing, and abstracting materials; and the development of the Materials Accession Process (MAP) for using teacher input to locate materials and media. Among recommendations covered in a final section is the refinement of MAP and its application to all handicap areas. A second volume contains appended materials which include the following: papers on teaching toilet training and related toileting skills to the developmentally delayed child, on a proposed model for adapting "career discoveries" for use with educable mentally handicapped students, on adaptation of the I CAN primary skills materials for use with severely emotionally impaired/autistic children (5 to 7 years old), on development of a prototype eye teaching system with communication aides for non-vocal severely handicapped children, and on a field test of toilet training with the developmentally delayed child; a material descriptor checklist; and a list of Center products. (SBH)

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Final Technical Report

Specialized Office Three
The Wisconsin Research and Development Center
for Cognitive Learning
University of Wisconsin
Madison, Wisconsin 53706

September 1, 1974 through July 31, 1977

Contract No. 300-75-0044

November 15, 1977

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FINAL TECHNICAL REPORT: S-3

9/1/74 - 7/31/77

ABSTRACT

The Final Technical Report of Specialized Office Three (S-3) describes the activities of S-3 in improving the quality of instruction provided to individuals with exceptional educational needs, other than the deaf and blind, through media, materials, and educational technology. S-3 was primarily involved in locating and evaluating existing instructional materials for its target population; adapting instructional materials to make them more appropriate for the target population; and evaluating materials with the target population.

S-3 entered 14,321 instructional media and materials into the National Instructional Materials Information System (NIMIS). A standardized system for locating, accessing, and abstracting materials was initiated and the Materials Accession Process (MAP) for using teacher input to locate materials and media was developed. S-3 also developed a systematic procedure (Adapting Instructional Materials [AIM]) for identifying and adapting/developing products to better meet the needs of the target population. Two materials were carried through the AIM process and were formally evaluated.

S-3 recommends a focus in future project efforts on the refinement of the MAP and its application to all handicap areas. S-3 further recommends a review and reorganization of Thesaurus descriptors and handicapping condition codes and for the further standardization and simplification of the "locate abstract" process. Continued use of the product adaptation and development procedure is also strongly urged.

Contract No. 300-75-0044

Final Technical Report of Specialized Office Three

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This project reported herein was performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U.S. DEPARTMENT OF
HEALTH, EDUCATION AND WELFARE
Office of Education
Bureau of Education for the Handicapped

PREFACE

Specialized Office Three (S-3), located at the University of Wisconsin, Madison, Wisconsin, was funded by the U.S. Office of Education, Bureau of Education for the Handicapped. This report describes the activities of S-3 from its funding in September 1974, through July 1977, when the present contract ended.

The mission of S-3 was to improve the opportunity for handicapped children to receive the best possible education with the use of educational technology through S-3's involvement in the following major workscopes:

1. To locate, adapt, develop, describe, and recommend instructional materials for use with other handicapping conditions, namely: mentally retarded, emotionally disturbed, specific learning disabled, speech impaired, orthopedically handicapped and other health impaired multiply handicapped.
2. To provide specialized consultive support and technical assistance in the areas of the handicapping conditions specialities and production support in media, materials and education technology training material development.
3. To identify those materials which should be included in the National Instructional Materials Information System and describe and encode these materials for data base entry.

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I. PROJECT FRAMEWORK

A. Project Background

The Specialized Office for all "other" handicapping conditions (S-3) was established on September 1, 1974 at the University of Wisconsin-Madison as the result of a proposal submitted in response to RFP 74-8. This three-year continuation contract (No. 300-75-0044) was administratively based within the Wisconsin Research and Development Center for Cognitive Learning, a noninstructional department of the School of Education.

The mission of the Wisconsin Research and Development Center for Cognitive Learning (R & D Center) is to help learners develop as rapidly and effectively as possible their potential as human beings and as contributing members of society. The R & D Center is striving to fulfill this goal by:

1. conducting research to discover more about how children learn;
2. developing improved instructional strategies, processes, and materials for school administrators, teachers, and children; and
3. offering assistance to educators and citizens which will help transfer the outcomes of research and development into practice.

The Wisconsin R & D Center is one of nine university-based educational research and development centers and nine educational laboratories started under the Cooperative Research Act (as amended by Title IV of the Elementary and Secondary Education Act of 1965).

The Center currently operates two programs: (1) Individually Guided Education or IGE and (2) Enhancing Education for Exceptional Children. IGE includes both research components and development conponents. The program Enhancing Education for Exceptional Children, which is directed toward meeting the unique needs of gifted, handicapped, or disadvantaged children, had as its main component Specialized Office Three funded by the Bureau of Education for the Handicapped.

The target population for the three Specialized Offices (S-1, S-2, and S-3) was the total population of handicapped children nationally. "'Handicapped children' means mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, orthopedically impaired, or other health impaired children or children with specific learning disabilities who by reason thereof require special education and related service [U.S. House of Representatives and U.S. Senate, 1975]." The best available sources on the prevalence and number of handicapped children aged 3 to 21 indicate that there are approximately 7.8 million children within the overall population of all children aged 3 to 21 or approximately 12 percent with handicaps. The Bureau of Education for the Handicapped used a number of statistical sources to develop a prevalence chart by diagnostic category for the Committee on Education and Labor which is shown in Table 1 (U.S. House of Representatives, 1975, p. 11).

S-1 served the needs of the blind and partially sighted. S-2 served the needs of the deaf and hearing impaired. S-3 served all other handicapped children including the mentally retarded, seriously emotionally disturbed, specific learning disabled, orthopedically handicapped or other health impaired, speech handicapped, and the multiply handicapped. It should be noted, however, that this target population was not directly served by S-3. Instead, S-3 services were channeled through the 13 Area Learning Resource Centers (ALRC) which had the responsibility for providing direct services to students.

More detailed definitions for each of the groups of handicapped served by S-3 follow. Definitions are provided to facilitate inclusion or exclusion of individuals into the various categories of handicapping conditions. If definitions have been provided by the U.S. Office of Education (USOE) or the Bureau of Education for the Handicapped (BEH), they are cited. When no definition was available from USOE/BEH, special education literature provided the source for the definitions.

Mentally retarded. Two definitions have been provided in recent years for the purposes of classifying an individual as mentally retarded. The first substantive definition provided by Heber (1961) states:

> Mental retardation refers to subaverage general intellectual functioning which originates during the developmental period and is associated with impairments in adaptive behavior.

Another recent definition, which has been provided by the American Association on Mental Deficiency (AAMD) (Grossman, 1973), states:

> Mental retardation refers to significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior, manifested during the developmental period.

The 1973 revision of The Manual on Terminology and Classification in Mental Retardation, published by the American Association on Mental Deficiency (AAMD) (Grossman), lists four classifications of retardation based on measured intelligence. The classifications are (1) mild, (2) moderate, (3) severe, and (4) profound. The standard deviation range for each level is (1) -2.01 to -3.00 (mild), (2) -3.01 to -4.00 (moderate), (3) -4.01 to -5.00 (severe), and (4) -5.01 and below (profound). These correspond to IQ ranges on the Binet (B) and the Wechsler (W) as follows: (1) B--68-52, W--69-54 (mild); (2) B--51-36, W--54-40 (moderate); (3) B--35-20, W--39-25 (severe); and (4) B--19 and below, W--24 and below (profound) (Grossman, 1973).

Table 1

PREVALENCE AND NUMBER OF HANDICAPPED CHILDREN

	Prevalence	Number of Children 5-17 years
Visually handicapped	0.1	51,800
Deaf	.75	38,900
Hard of hearing	.5	259,000
Speech handicapped	3.5	1,813,000
Crippled and other health impaired	.5	259,000
Emotionally disturbed	2.0	1,026,000
Mentally retarded	2.3	1,185,400
Learning disabilities	3.0	1,554,000
Multiply handicapped	.06	31,000
Total	12.035	6,218,200

The largest percentage of individuals who are considered in this population are those who are classified as the educable mentally retarded (Robinson, 1965). These children have IQ scores from about 52 to 68, which translates into an intellectual development of approximately one-half to two-thirds the rate of the average child (Grossman, 1973). Therefore, at six years of age, they are cognitively like children between three and four years old. In adulthood, their intellectual development approaches eight to eleven years, which implies that the most able of this group can be expected to achieve academically at about the sixth grade level (Sloan & Birch, 1955). It should be noted that the attainment potential of these individuals is as yet untested.

Of the total school aged population, approximately 2.3 percent are mentally retarded (Dunn, 1973). According to statistics tabulated in 1974, of a total of 1,507,000 children, 1,200,000 were receiving service through educational programs and 307,000 were not receiving service (U.S. House of Representatives, 1975, p. 12).

Emotionally disturbed. "The following criteria may be used to determine those children who are seriously emotionally disturbed: those children who exhibit one or more of the following characteristics over a long period of time and to a marked degree: (a) an inability to learn which cannot be explained by intellectual, sensory, or health factors; (b) an inability to build or maintain satisfactory interpersonal relationships with peers and teachers; (c) inappropriate types of behavior or feeling under normal circumstances; (d) general pervasive mood of unhappiness or depression; or (e) a tendency to develop physical symptoms, pains, or fears associated with personal or school problems [Federal Register, 1973, p. 28231; Federal Register, 1975, p. 7412]." Of the school aged population it is estimated that approximately 2 percent are seriously emotionally disturbed (USOE, 1971). According to statistics tabulated in 1974, of the total school aged population of 1,310,000 emotionally disturbed children, 224,460 were receiving special educational services and 1,085,540 were not receiving special educational services (U.S. House of Representatives, 1975, p. 12).

Specific learning disabled. "Children with specific learning disabilities are those children who have a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. Such disorders include such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such terms do not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, emotional disturbance, or environmental, cultural, or economic disadvantage [Federal Register, 1973, pp. 28230-29231; Federal Register, 1975, p. 7411; U.S. House of Representatives, 1975; U.S. House of Representatives and U.S. Senate, 1975]." Of the school aged population, current estimates indicate that approximately 3 percent have specific learning disabilities (U.S. House of Representatives, 1975, p. 11). According to statistics tabulated in 1974, of the total school aged population of 1,966,000 specific learning disabled children, 226,725 were receiving special educational services and 1,739,275 were not receiving special educational services (U.S. House of Representatives, 1975, p. 12).

Speech impaired. An estimated 3.5 percent of the school population is classified as speech impaired (Dunn, 1973). According to statistics tabulated in 1974, of the total school aged population of 2,293,000 speech impaired children, 1,777,000 were receiving special educational services and 516,000 were not receiving special educational services (U.S. House of Representatives, 1975, p. 12).

Orthopedically handicapped and other health impaired. The orthopedically handicapped child is one who is disabled in motor abilities. An estimated .5 percent of the school aged population is classified as physically handicapped or as having other health impairments (Dunn, 1973). Health impaired pupils include those with cardiac dysfunction, diabetes, cerebral palsy, convulsive disorders, multiple sclerosis, and other musco-skeletal conditions. According to statistics tabulated in 1974, of the total school aged population of 328,000 orthopedically handicapped and other health impaired children, 230,000 were receiving special educational services and 98,000 were not receiving special educational services (U.S. House of Representatives, 1975, p. 12).

Multiply handicapped. A multiply handicapped child has been defined as any child with more than one disabling condition (Dunn, 1973). It has been estimated that .06 percent of the school aged population is multiply handicapped (Dunn, 1973). According to statistics tabulated in 1974, of the total school aged population of 40,000 deaf-blind and other severe and profoundly handicapped children, 12,000 were receiving special educational services (U.S. House of Representatives, 1975, p. 12).

Some of the types of multiple handicapping conditions which have been identified are deaf-blind; mentally retarded with severe vision or hearing problems; blind, deaf, retarded, and disturbed; physically handicapped, mentally retarded, and speech impaired.

A reflection of the incidence of multiple handicapping conditions among the physically handicapped is provided by a study by Friedman and MacQueen (1971). Of 195 children with physical handicaps, 43 percent were also found to be mentally retarded and 37 percent were also found to be speech impaired. Other handicapping conditions which occur with physical handicaps have been identified in a study of the children enrolled in the California Special Day classes for orthopedically handicapped and other health impaired. The results of this study were reported by the California State Department of Education (see Table 2). The highest incidence of other handicapping conditions with physical handicaps included mental retardation, speech, and vision impairments.

Table 2

SECONDARY PROBLEMS AMONG CHILDREN ENROLLED IN CALIFORNIA SPECIAL DAY CLASSES FOR THE ORTHOPEDICALLY HANDICAPPED AND OTHER HEALTH IMPAIRED (INCLUDING TELECLASSESO, 1971-1972

Type of Physical Defect	Numbers of Cases	Total with Defect	Mental Retardation	Speech	Vision	Hearing	Seizures	Social Behavior
Cerebral Palsy	3,079	48%	60%	52%	35%	5%	13%	27%
Muscular Dystrophy	387	6%	32%	12%	8%	0.52%	1%	19%
Other	2,986	46%	37%	26%	19%	3%	9%	20%
Total	6,452		47%	37%	26%	4%	11%	24%

SOURCE: Minors with orthopedia and other health impairments enrolled in special day classes (including teleclasses), 1971-1972. Mimeographed Report, Sacramento, Calif., State Department of Education, 1972.

A higher prevalence of multiple handicaps among the school aged population has just been identified within the last decade (Dunn, 1973). The occurrence and apparent increase in the number of multiply handicapped children being identified is undoubtedly due to both shifts in philosophy which encourage the examination and education of the whole child on an individual basis irrespective of the singular classificatory grouping of the child and an increase caused by medical advances which have prevented or ameliorated many types of single disabilities and have saved many children who would, under normal circumstances, have died at birth or not been born (Dunn, 1973). Also, with the passage of the new Education for All Handicapped Children Act of 1975 (U.S. House of Representatives and U.S. Senate, 1975), many of the more severely and profoundly handicapped who previously received no education are now being brought from institutions into public school programs.

A major need of this population was the development, distribution, and dissemination of information about suitable instructional materials. This need was one of the major areas of concern of S-3. A second need was the adaptation of existing commercial materials to meet the unique learning characteristics of various types of handicapped children, other than the deaf and blind. During the 1974-77 funding period, various materials were selected for adaptation.

B. Project Philosophy, Goals, and Objectives

The goal of providing full educational opportunity for all handicapped children by 1980 led to a national commitment to the education of the handicapped. As explained by Martin (1971), the right of a handicapped child to the special education needed is as basic to him or her as is the right of any other young citizen to an appropriate education in the public schools. It is unjust for our society to provide anything less than the full and equal educational opportunity needed by the handicapped to reach their maximum potential and attain rewarding, satisfying lives.

Consistent with the goal of providing equal educational opportunities to all handicapped children by 1980, the Learning Resources Branch of the Bureau of Education for the Handicapped established a program designed to improve the access handicapped children have to quality educational media, materials, and educational technology (Federal Register, 1973, 1975). This was to be provided through the Learning Resource Center Program.

Learning Resource Center Program. The Learning Resource Center (LRC) Program consisted of 32 separate agencies which worked together nationally to provide improved access to quality instructional media, materials, and educational technology for all handicapped children. Included in the LRC Program were: 13 Area Learning Resource Centers (ALRCs), 13 Regional

Resource Centers (RRCs), and 6 national offices--The National Center on Education Media and Materials for the Handicapped (NCEMMH), Specialized Offices One, Two, Three, and Four (S-1, S-2, S-3, and S-4), and the Coordinating Office for Regional Resource Centers (CORRC). Each agency within the LRC Program had specific program responsibilities.

The LRC Program had been organized and structured so that duplication of effort was minimized through the development of a concept of specialized function and role. NCEMMH served as a coordinating agent for te LRC Program and was charged along with the Specialized Offices with the responsibility of developing a national information system on instructional materials. NCEMMH was also responsible for getting BEH-developed educational products into commercial production.

The ALRCs and RRCs were the field units within the LRC Program. These programs were regional in scope. The major role of the ALRCs was to provide media, materials, and educational technology training for teachers and improved access to better quality media and materials for handicapped children through cooperative planning with the State Education Agencies (SEAs). In part, this service was provided through the development of local, metropolitan, intermediate-unit, state, and regional instructional materials service agencies. The ALRCs were the instructional media and material and educational technology support units within the LRC Program.

The major role of the RRC was to develop testing, appraisal, and evaluation procedures which can be used to determine the specific educational needs of the handicapped and to use this diagnostic information about the learner to make education program recommendations and placements. The RRCs were involved in: (1) referral and screening, (2) individual assessment, (3) development of appropriate individualized educational program placement, (4) implementation of appropriate educational program placements, and (5) provision and maintenance of testing appraisal and evaluation programs for the assessment of the effectiveness of individual educational programs to assure that the educational program placement which has been initiated is still appropriate.

The workscope of the Specialized Offices was national in scope. Three of the Specialized Offices (S-1, S-2, and S-3) were established to locate, evaluate, adapt, develop, describe, and recommend instructional materials for use with particular groups of handicapped children. S-3 was established to serve all children with "other" handicapping conditions. The three Specialized Offices (S-1, S-2, and S-3) were also established to provide specialized consultive support and technical assistance in the areas of their handicapping condition specialities and production support in media, materials, and educational technology training material development. The three Specialized Offices (S-1, S-2, and S-3) also identified those materials which should be included in the NIMIS system and described and encoded these materials for data base entry.

The fourth Specialized Office (S-4) served as a national depository for the LRC Program's collection of materials. The goal of the LRC Program was to provide for the media and materials needs of the handicapped on a national scale.

The Specialized Office Three Program. The goal of S-3 was to provide better educational opportunities for the mentally retarded (MR), specific learning disabled (SLD), emotionally disturbed (ED), speech impaired (SI), physically handicapped and other health impaired (PH/OHI), and multiply handicapped (MH) by improving the quality of instruction being provided through media, materials, and educational technology. This goal was to be met by the completion of the workscope activities of S-3.

During the three years of the project, S-3 was involved in efforts to: (1) reinforce ALRCs; (2) assist Educational Testing Service (ETS) in the national needs assessment; (3) locate materials; (4) adapt materials; (5) develop materials; (6) field test materials; (7) provide technical assistance; (8) assist NCEMMH in the development of NIMIS; (9) develop standards and criteria for materials evaluation; (10) advise S-4 on materials acquisition; (11) interact with other LRC Program agencies; and (12) manage the S-3 project. The specific strategies which have been undertaken in each of these areas are shown in Table 3.

There were three key operational objectives for S-3: (1) locate and evaluate existing instructional materials suitable for use with all "other" handicapping conditions; (2) adapt/develop instructional materials which were unavailable and "unattractive" to commercial developers; and (3) evaluate the adapted/developed materials with appropriate target populations. The major operational objective for S-3 was to locate and evaluate suitable instructional materials for all "other" handicapping conditions for entry into the National Instructional Materials Information System (NIMIS) being developed by the National Center on Educational Media and Materials for the Handicapped at Ohio State University.

In negotiation with the Bureau of Education for the Handicapped, Division of Educational Media Services, Learning Resources Branch, S-3 established the following operational priorities per funding period for the key objectives discussed above:

First funding period, 1974-1975

A. Top priority was to locate and evaluate instructional materials for potential entry into NIMIS.
B. All other project activities were to be completed as necessary.
C. The procedures for the adaptation and modification of existing instructional materials were not to be initiated until the second funding period.

Second funding period, 1975-1976

A. Top priority was to continue locating and evaluating instructional materials for potential entry into NIMIS.

Table 3

SPECIALIZED OFFICE THREE WORKSCOPE OUTLINE

1. Reinforce ALRCs

    IT-01-1: Supply information about Special Office services
    IT-01-2: Provide assistance with ALRC workshops and demonstrations
    IT-01-3: Provide specialized consultant services
    IT-01-4: Evaluate assistance provided to ALRCs

2. Assist ETS in the national needs assessment

    IIA-01-1: Take part, as needed, in national needs assessment activities
    IIE-01-1: Review national needs assessment output, identify material needs and establish priorities by handicapping condition
    IIE-01-2: Structure development processes

3. Locate materials

    IIC-01-1: Locate commercially produced materials in distribution
    IIC-01-2: Locate teacher-made materials
    IIC-01-3: Locate materials produced by federally-funded projects
    IIC-02-1: Organize and monitor appropriate catalog files
    IIC-02-2: File potentially useful materials references
    IIC-02-3: Locate materials references for LRCP units

4. Adapt materials

    IID-01-1: Operate adaptation system
    IID-01-2: Produce handicap-related adaptations
    IID-01-3: Assess adaptation process alternatives which are material dependent
    IIF-01-1: Conduct field tests of newly developed materials
    IIF-01-2: Maintain evaluation article resource files
    IIF-01-3: Review evaluation and/or field test reports to assess materials' effects

5. Develop materials

    IIE-02-1: Develop needed materials

6. Field test materials

    IIF-01-1: Conduct field tests of newly developed materials

Table 3 (Cont.)

SPECIALIZED OFFICE THREE WORKSCOPE OUTLINE

7. Provide technical assistance

IIIV-01-1: Provide technical assistance in the selection and use of media materials for handicapped children
IIIV-01-2: Conduct training sessions for ALRCs
IIIW-01-1: Provide assistance in the design and production of training materials

8. Assist NCEMMH in developing NIMIS

IVA-01-1: Identify preliminary NIMIS-input candidates from IIC files
IVA-01-2: Acquire materials for in-house review/evaluation
IVA-02-4: Develop standards and criteria for NIMIS-entry assessment
IVB-01-1: Evaluate NIMIS-entry candidates by standard criteria
IVC-01-1: Participate in Thesaurus development and updating
IVC-01-2: Train and monitor in-house abstractors
IVC-01-3: Conduct initial abstracting for NIMIS entry
IVC-01-4: Revise abstracts already in NIMIS
IVC-02-1: Assess abstract format
IVC-02-2: Assess handicapping condition subcategory needs
IVC-02-3: Participate in NIMIS training session

9. Develop standards and criteria for materials evaluation

IVA-02-1: Develop standards and criteria for selection of useful instructional materials
IVA-02-2: Develop standards and criteria for adaptation of useful instructional materials
IVA-02-3: Develop standards and criteria for development of useful instructional materials

10. Advise S-4 on materials acquisition

VT-01-1: Advise and make recommendations to S-4 on purchases and balance of holdings

11. Interact with other LRC Program agencies

VIB-01-1: Serve as liaison with LRC Program units
VIB-01-2: Participate in meetings and conferences

12. Manage the project

VIA-01-3: Allocate resources
VIA-01-4: Produce management strategies

Table 3 (Cont.)

SPECIALIZED OFFICE THREE WORKSCOPE OUTLINE

12. Manage the project (cont.)

VIA-01-5:	Conduct Staff in-service training sessions
VIA-02-1:	Monitor Specialized Office activity
VIA-02-2:	Monitor professional time
VIA-02-3:	Monitor budget categories
VIA-02-4:	Prepare internal management reports
VIA-03-1:	Prepare progress reports
VIA-03-2:	Prepare technical reports

B. Second priority was the adaptation/development of instructional materials which were unavailable and unattractive to commercial developers.
C. Third priority was to evaluate the adapted instructional materials.
D. Fourth priority was to participate in LRCP coordination activities and committees.

Third funding period, 1976-1977

A. Top priority continued to be the location and evaluation activities for NIMIS materials.
B. Second priority continued to be the adaptation procedures for existing instructional materials.
C. Third priority continued to be the evaluation of the adapted instructional materials with appropriate population.
D. Fourth priority continued to be participation in LRCP coordination activities and committees.
E. Fifth priority was to reinforce Area Learning Resource Centers (ALRCs) in intrastate media workshops, demonstrations, consultations, and disseminations.

The operational objectives and priorities of S-3 were primarily determined, of course, by the scope of work specified in RFP 74-8 and by the overall objectives of the Bureau of Education for the Handicapped (BEH). The BEH objectives which influenced the direction of the S-3 project are listed below. Each BEH objective is accompanied by the pertinent overall objective of S-3.

1. BEH Objective

To assure that every handicapped child is receiving an appropriately designed education by 1980 (85 percent by 1978).

S-3 Objective

To assist BEH in achieving these objectives by helping find, select, and adapt instructional materials for the S-3 target population.

2. BEH Objective

To secure the enrollment of 850,000 (85 percent) preschool aged handicapped children in federal, state, and local educational day care programs.

S-3 Objective

To assist BEH in achieving this objective by cooperating with the Area Learning Resource Centers and Regional Resource Centers in finding educational materials for the S-3 target population.

3. BEH Objective

To assure that all handicapped children served in the schools have sufficient trained personnel who are competent in the skills required to aid the child in reaching his or her full potential.

S-3 Objective

To assist BEH in achieving this objective by improving the media competencies of teachers, supervising teachers, support staff, parents, college educators who prepare teachers to teach the target population, and media specialists through Area Learning Resource Centers.

4. BEH Objective

To enable the most severely handicapped children and youth to become as independent as possible, thereby reducing their requirements for institutional care and providing opportunity for self-developemnt.

S-3 Objective

To assist BEH in achieving this objective by studying the unique learning problems of the severely handicapped, selecting or designing instructional materials to match the learning requirement and evaluating progress through a consortium with other Specialized Offices.

These objectives did not change over the course of the three-year funding period and were stated as such in each of the updated proposals for this continuation contract.

In regard to the scope of work specified in RFP 74-8, it remained the same for both FY 1975 and FY 1976. As a result, the S-3 workscope activities also remained the same for the first and second funding years. However, during the third and final funding year, the workscope for the Specialized Offices was elaborated and some additional activities were added to it (refer to SO WORKSCOPE ELABORATION for Use in Preparation of FY 1977 SO Continuation Requests, prepared by Coordination Services, NCEMMH, March 12, 1976, Publication No. NC-76.503). Therefore, S-3 was able to select some additional workscope activities during the third funding year.

C. Project Organization

The current leadership, staffing, and administrative organization of S-3 was put in place at the beginning of the S-3 third year of operation. At that time S-3 was organized into three distinct operational sections to accomplish the scope of work. These three sections facilitated the management of the project because they "clustered" the workscope tasks which were related into a functional system. The three operational sections with workscope responsibilities (in terms of summary strategies) are listed below. It should be noted that some workscope strategies are shared between some sections.

1. S-3 Administration

Manage the project

VIA-01-3: Allocate resources
VIA-01-4: Produce management strategies
VIA-01-5: Conduct staff in-service training sessions
VIA-02-1: Monitor Specialized Office activity
VIA-02-2: Monitor professional time
VIA-02-3: Monitor budget categories
VIA-02-4: Prepare internal management reports
VIA-03-1: Prepare progress reports
VIA-03-2: Prepare technical reports

Interact with other LRC Program agencies

VIB-01-1: Serve as liaison with LRC Program units
VIB-01-2: Participate in meetings and conferences

Assist ETS in the national needs assessment

IIA-01-1: Take part, as needed, in national needs assessment activities
IIE-01-1: Review national needs assessment output, identify material needs and establish priorities by handicapping condition
IIE-01-2: Structure development processes

Provide Technical Assistance

IIIV-01-1: Provide technical assistance in the selection and use of media materials for handicapped children
IIIV-01-2: Conduct training sessions for ALRCs
IIIW-01-1: Provide assistance in the design and production of training materials

Develop standards and criteria for materials evaluation

IVA-02-1: Develop standards and criteria for selection of useful instructional materials
IVA-02-2: Develop standards and criteria for adaptation of useful instructional materials
IVA-02-3: Develop standards and criteria for development of useful instructional materials

2. Materials evaluation and analysis

Locate materials

IIC-01-1: Locate commercially produced materials in distribution
IIC-01-2: Locate teacher-made materials
IIC-01-3: Locate materials produced by federally-funded projects
IIC-02-1: Organize and monitor appropriate catalog files
IIC-02-2: File potentially useful materials references
IIC-02-3: Locate materials references for LRC Program units

Assist NCEMMH in developing NIMIS

IVA-01-1: Identify preliminary NIMIS-input candidates from IIC files (listed above)
IVA-01-2: Acquire materials for in-house review/evaluation
IVA-02-4: Develop standards and criteria for NIMIS-entry assessment
IVB-01-1: Evaluate NIMIS-entry candidates by standard criteria
IVC-01-1: Participate in Thesaurus development and updating
IVC-01-2: Train and monitor in-house abstractors
IVC-01-3: Conduct initial abstracting for NIMIS entry
IVC-01-4: Revise abstracts already in NIMIS
IVC-02-1: Assess abstract format
IVC-02-2: Assess handicapping condition subcategory needs
IVC-02-3: Participate in NIMIS training session

Advise S-4 on materials acquisition

VT-01-1: Advise and make recommendations to S-4 on purchases and balance of holdings

3. Materials adaptation and development

Reinforce ALRCs

IT-01-1: Supply information about Special Office services
IT-01-2: Provide assistance with ALRC workshops and demonstrations
IT-01-3: Provide specialized consultant services
IT-01-4: Evaluate assistance provided to ALRCs

Adapt materials

IID-01-1: Operate adaptation system
IID-01-2: Produce handicap-related adaptations
IID-01-3: Assess adaptation process alternatives which are material dependent
IIF-01-1: Conduct field tests of newly developed materials
IIF-01-2: Maintain evaluation article resource files
IIF-01-3: Review evaluation and field test reports to assess materials' effects

Develop materials

IIE-02-1: Develop needed materials

Field test materials

IIF-01-1: Conduct field tests of newly developed materials

Figure 1 shows the relationship of S-3 to the R & D Center and University of Wisconsin Administrative Units. Figure 2 shows the relationship between the operational sections of the S-3 organization as well as the key personnel involved in each section.

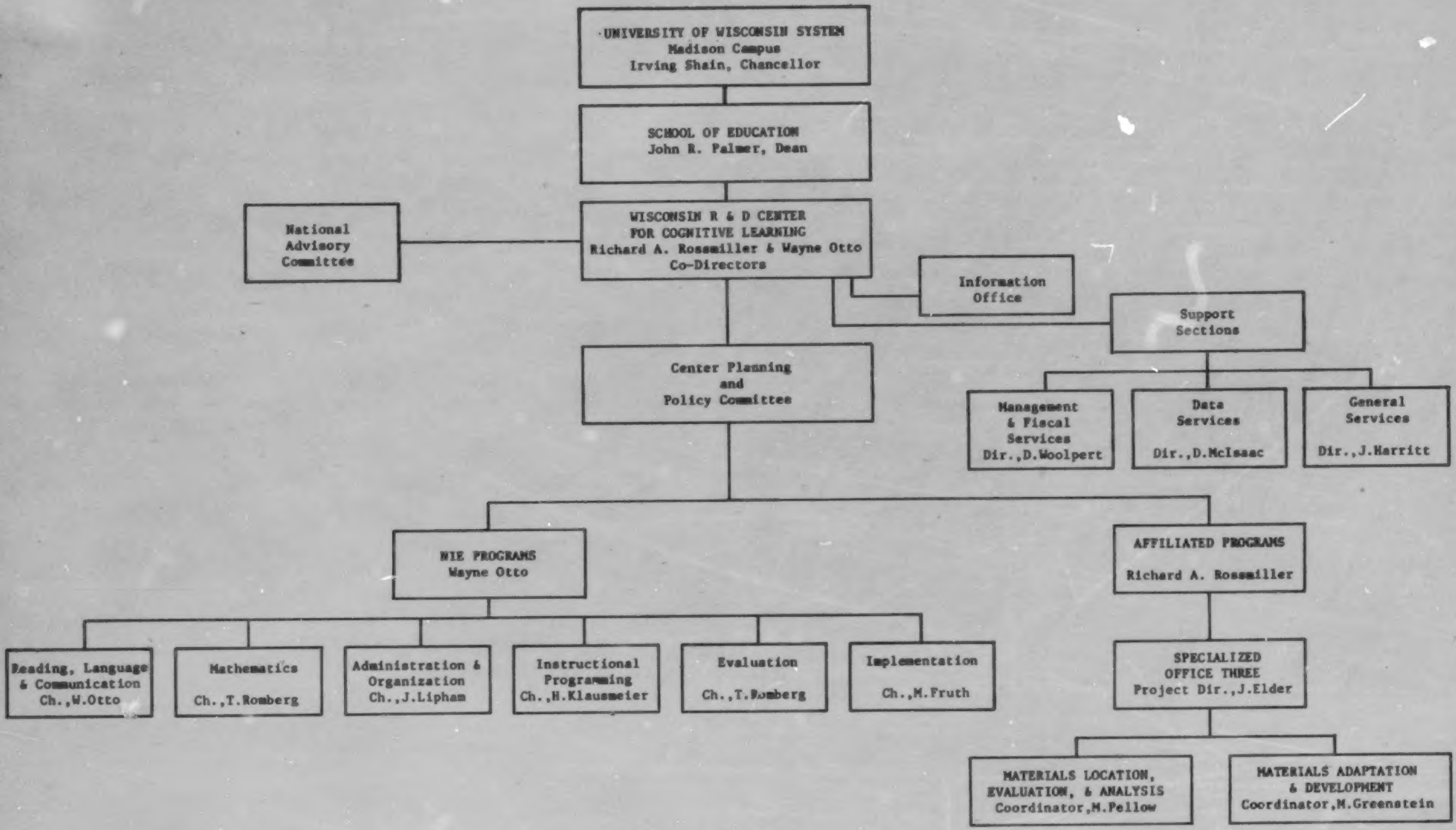

UNIVERSITY OF WISCONSIN SYSTEM
Madison Campus
Irving Shain, Chancellor
SCHOOL OF EDUCATION
John R. Palmer, Dean
National Advisory Committee
WISCONSIN R & D CENTER FOR COGNITIVE LEARNING
Richard A. Rossmiller & Wayne Otto
Co-Directors
Information Office
Support Sections
Center Planning and Policy Committee
Management & Fiscal Services
Dir., D.Woolpert
Data Services
Dir., D.McIsaac
General Services
Dir., J.Harritt
NIE PROGRAMS
Wayne Otto
AFFILIATED PROGRAMS
Richard A. Rossmiller
Reading, Language & Communication
Ch., W.Otto
Mathematics
Ch., T.Romberg
Administration & Organization
Ch., J.Lipham
Instructional Programming
Ch., H.Klausmeier
Evaluation
Ch., T.Romberg
Implementation
Ch., M.Fruth
SPECIALIZED OFFICE THREE
Project Dir., J.Elder
MATERIALS LOCATION, EVALUATION, & ANALYSIS
Coordinator, M.Pellow
MATERIALS ADAPTATION & DEVELOPMENT
Coordinator, M.Greenstein

Figure 17. Relationship of S-3 to R & D Center and University Administrative Units

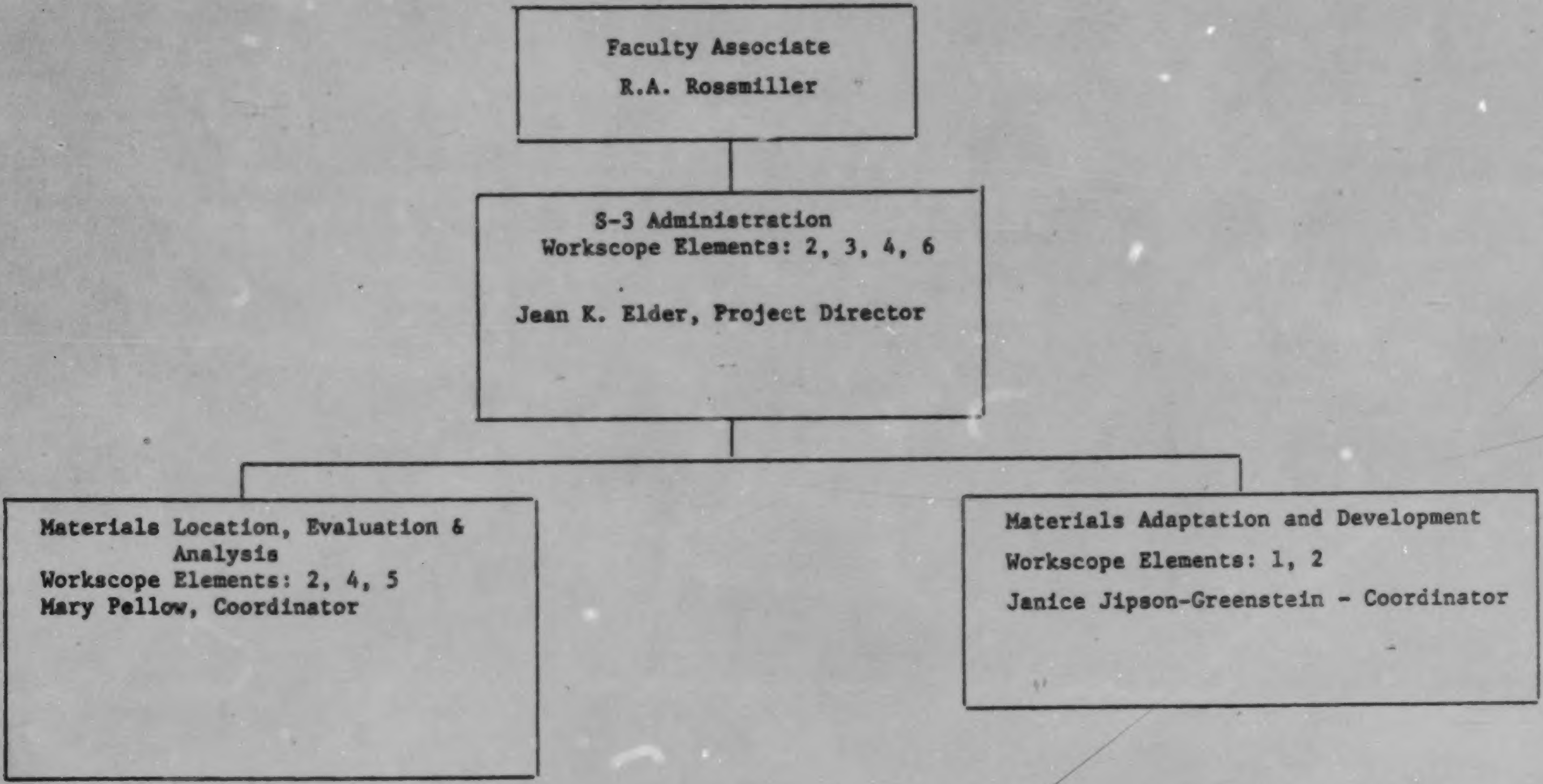

Faculty Associate
R.A. Rossmiller
S-3 Administration
Workscope Elements: 2, 3, 4, 6
Jean K. Elder, Project Director
Materials Location, Evaluation & Analysis
Workscope Elements: 2, 4, 5
Mary Pellow, Coordinator
Materials Adaptation and Development
Workscope Elements: 1, 2
Janice Jipson-Greenstein - Coordinator

Figure 2. S-3 Organizational Chart, Workscope Responsibilities and Key Personnel

II. STATEMENT OF WORK

A. Introduction

The diversity of individuals with exceptional educational needs and the wide variety of instructional materials which could be provided in meeting their needs, necessitated the development of a systematic process. This process examined the provision of instructional materials to the target population, evaluated the basic characteristics of the materials as well as those of the individuals, and when necessary, adapted and developed materials to better meet those needs. S-3 recognized the need for a comprehensive instructional materials and media service which would assist teachers in selecting and using instructional materials and media as an important technique in aiding pupils to reach their individual goals and objectives. The following workscope strategies describe the major activities of S-3 in providing this service.

B. Element Strategies

Summary Strategy IT-01: Reinforce intrastate efforts by providing assistance to ALRCs.

Specialized Office Three (S-3) proposed on June 15, 1975, to reinforce the ALRC activities through intrastate workshops, demonstrations, consultations, and material dissemination. S-3 had as its role and responsibility the development of expertise in the following handicapping conditions: mentally retarded, emotionally disturbed, learning disabled, speech handicapped, physically handicapped, and multiply handicapped. S-3 expertise was sought by the ALRCs to provide assistance needed for workshops, demonstrations, and consultations requested by the states they served.

The ALRCs were to help improve the quality of education being provided for handicapped pupils and students by developing teachers' knowledge of and competence in using various forms of media and materials. Specialized Offices were to provide backup support to facilitate getting the most appropriate and effective instructional materials and media implemented in the classrooms which serve handicapped children. The types of supportive services which S-3 offered included the provision of information, consultation in the S-3's handicapping conditions categories, and general technical and professional assistance.

Assistance was provided to ALRCs by responding to their requests for information, providing programmatic information, assisting with workshops and demonstrations, and providing specialized consultation services upon request.

When calls or letters were received from ALRCs, pertinent request information was compiled on an ALRC Request Form (Figure 3). This form provided a mechanism for tracking incoming requests, following through on responses, and tabulating any feedback received. Sending the form to the person requesting the information provided an opportunity for the recipient to give feedback to S-3 as to the adequacy of the information provided.

The staffing plan to handle this activity included: (1) the Project Secretary receives the calls for infomration and determines a response plan; (2) the Project Secretary fills out an ALRC Request Form on the information to be provided; (3) the Project Secretary contacts project specialists in the particular handicapping condition area--such as mental retardation, specific learning disabilities, and emotional disturbance--to assist in the location of the required information and materials; and, (4) the Project Director verifies and approves all plans for response. Each request for assistance from an ALRC was logged and the type of response provided was recorded. S-3 was engaged in the following specific activities:

1. Information regarding the purposes, activities, and operations of S-3 was supplied upon request. Thirty-seven requests were received and responded to during the first program year, 118 during the second, and 97 during the third.
2. S-3 participated in a workshop on materials for the hearing impaired and the severely, profoundly, and mulitply handicapped in October 1976.
3. Consultant services and information regarding the handicapping conditions which S-3 represented were provided upon request. Specific information concerning those requests for assistance received and those honored for each program year is presented in Table 4. Requests for assistance were received from ALRCs as well as from special education teachers and other education professionals.

During the fourth quarter of the first project year, 1974-75, an information packet on vocational education (pertaining to the handicapped population served by S-3) was prepared in cooperation with the University of Wisconsin Vocational Education Center and was sent to each of the ALRCs.

The aforementioned process, while providing information to an average of 100 people in each of the final two years, was not as useful in assisting the ALRCs as it could have been. Because S-3 lacked the budget to actively search information concerning their handicapping conditions, materials sent to ALRCs were generally those criterion documents developed at S-3. The user feedback system did not work effectively to determine the appropriateness and usefulness of the support services.

ALRC REQUEST FORM

Person Requesting Information

____

____

____

ALRC ____

Request Made: Date: ________________

____

____

____

____

____

Materials Provided: Date: ________________

____

____

____

____

____

Feedback: Date: ________________

____

____

____

Ramp Charge Number

☐ 6.4.10.10.01.01.01.01	Respond to requests for information
☐ 6.4.10.10.01.01.01.02	Provide programmatic information
☐ 6.4.10.10.01.01.01.03	Assist with workshops and demonstrations
☐ 6.4.10.10.01.01.01.04	Provide consultation
☐ 6.4.10.30.01.01.02.01	Process requests for information

Figure 3. ALRC Request Form

Table 4

ALRC REQUESTS RECEIVED AND
HONORED BY S-3 (1974-1977)

	Quarters				
	Q1	Q2	Q3	Q4	Total
Year 1					
Requests received	5	13	12	7	37
Requests honored	5	13	12	7	37
Year 2					
Requests received	22	44	35	17	118
Requests honored	22	40	35	17	114
Year 3					
Requests received	16	31	33	21	97
Requests honored					
ALRC	6	5	--	--	11
General public	10	21	23	11	65
1. Teacher Made/Teacher Modified Materials	6	8	14	11	39
2. Learning Disabilities, Mathematics		?			?
3. Bibliography of Tests			1		1
4. Bibliography of Curriculum Guides	1	1			2
5. Individually Guided Education Information		1	2		3
6. Teacher Use, Instructional Materials, Special Education	1		1		2
7. Other and Unknown	7	9**	4*		20***
8. NIMIS information--General	1	4	1		6
9. NIMIS Procedures		1			1
10. Contact Referred to Another Office		2			2

*Indicates number of requests for "all" publications on hand.

A more appropriate future response to this workscope would include planned material collection and workshop presentations on a regularly scheduled basis determined by a specific assessment of the needs of the populations involved.

Summary Strategy IIA-01: Participate in phase-in national needs assessment efforts.

The national needs assessment (NNA), funded by BEH and contracted to the Educational Testing Service (ETS) at Berkeley, was an attempt to document, on a national basis, the educational needs of handicapped students. A set of specially designed survey instruments was to have been sent to approximately 150,000 special education professionals in both the public and private sector in order to collect this data. The NNA has repeatedly been delayed--first by the decision to use a proposal approach and later by protracted delays in form clearance. S-3 provided support to ETS-Berkeley in the design of the survey instruments during 1975-1976.

Summary Strategy IIC-01: Locate useable materials which exist and fulfill identified needs.

This workscope included the tasks of searching major sources for useable materials and maintaining instructional materials reference files. The search aspect of the strategy involved locating commercially produced materials by examining publisher catalogs and exhibits for potentially appropriate items. Also included were locating teacher-made materials and materials produced by federally funded projects. The maintenance function of the strategy included the activities of organizing and monitoring catalog files, filing potentially useful material information, locating and sharing material reference documents with LRC Program units, and periodically reassessing the reference system and filing efficiency.

In providing the service of identifying materials which would be useable and could fulfill identified needs, it was proposed that S-3 develop major systems for the location, assessment, adaptation, and development of instructional materials. In meeting the goal of the first system, S-3 was to generate a system to locate instructional materials for the S-3 handicapped population which would include mechanisms for: (1) determining the instructional needs of the S-3 handicapped population, (2) locating instructional materials and organizational structures which would meet these needs, (3) evaluating the completeness and quality of information currently available on instructional materials and organizational structures, and (4) determining the informational requirements for making materials use recommendations.

The plan for location and accessioning of materials was not fully developed in the first two years of the project. Materials lists were generated and used to locate materials from the old SEIMC Network as well as from various ALRCs, in particular, Texas, but an overall systematic plan did not evolve until the third year of the project.

In the third year, the locate-access systems were developed and an orderly, functional process was set up so that materials were selected, ordered, distributed, sent to data entry, and returned to publishing sources in a cost-efficient manner (Figure 4).

Additional materials were selected and accessed primarily from commercial publishers. Files were maintained of various catalogs and were screened weekly for useful materials. Five hundred items were chosen from these catalogs on a weekly basis. Catalogs were screened for (1) appropriateness of the material and (2) non-duplication of effort either by S-3, S-1, or S-2.

Materials Accession Process (MAP) was developed in October 1976 as a process for including other users such as teachers and therapists in the locate function. This process was tested with the American Association for the Education of Severely and Profoundly Handicapped (AAESPH) from April 1977 to July 1977 (Figure 5).

One of the major concerns of S-3 was that the pool of NIMIS entries be representative of the materials actually being used in the field. After searching commercial and public sources, it became apparent to the S-3 staff that some disability groups, such as the severely and profoundly handicapped and speech impaired, were not adequately represented in the NIMIS data base.

The original accession process, which went from locating published materials in sources such as publishers' catalogs, lists from the old IMC Network, and federal project indexes to accessing and abstracting each material for entry into NIMIS, did not permit professionals in the field who were the recipients of the information to directly participate in establishing the data base. These professionals, however, have the skills to determine their own needs and appropriate ways of meeting them, based on their experiences in the field. Thus, to improve NIMIS, the role of professionals was enlarged to include involvement in the initial locate function (Figure 6).

S-3 selected AAESPH as the first professional group with which to work. AAESPH provided S-3 with immediate access to professionals working with and testing educational materials for severely handicapped persons. AAESPH agreed to locate, identify, and provide lists of child-use instructional materials to S-3, thereby establishing a more efficient and reliable method for identifying the greatest number of quality materials available to be entered into NIMIS.

The role of AAESPH included identifying materials which teachers and therapists have found to be effective with severely and profoundly handicapped individuals, developing a regional assistance and information coordination system to support NIMIS users, and initiating an educational campaign to increase awareness of NIMIS and its potential uses.

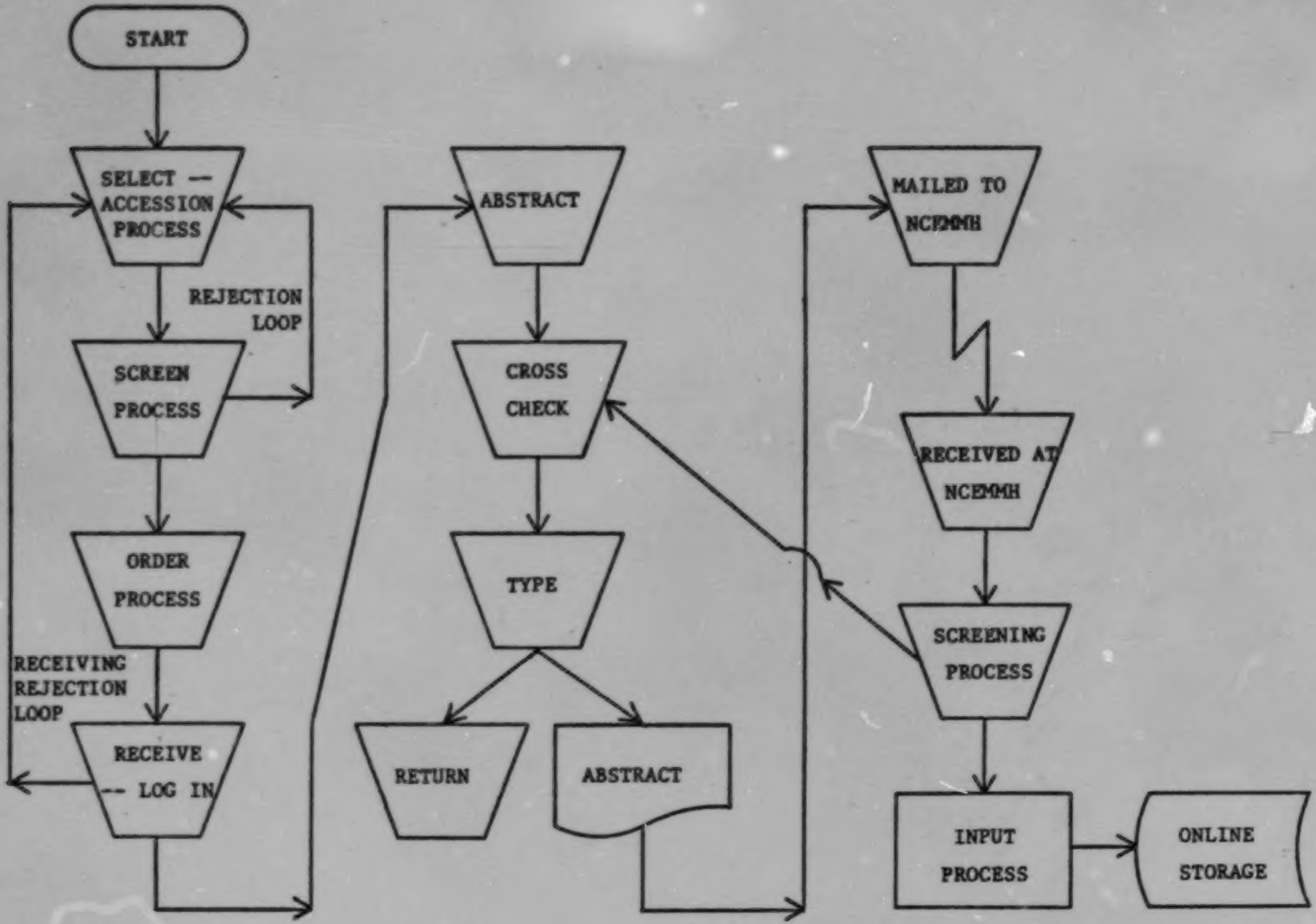

START
SELECT -- ACCESSION PROCESS
REJECTION LOOP
SCREEN PROCESS
ORDER PROCESS
RECEIVING REJECTION LOOP
RECEIVE -- LOG IN
ABSTRACT
CROSS CHECK
TYPE
RETURN
ABSTRACT
MAILED TO NCEMMH
RECEIVED AT NCEMMH
SCREENING PROCESS
INPUT PROCESS
ONLINE STORAGE

Figure 4. S-3 Locate-Accession System

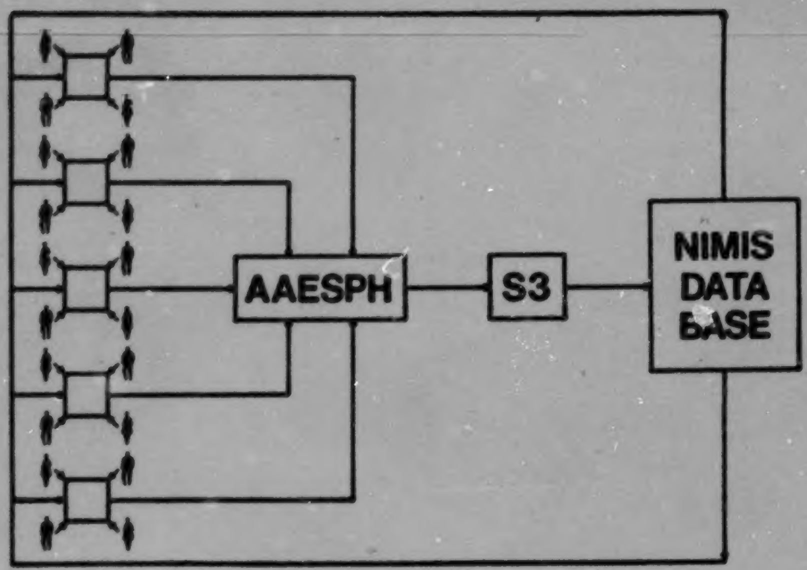

AAESPH
S3
NIMIS DATA BASE

Figure 5. S-3 AAESPH Map

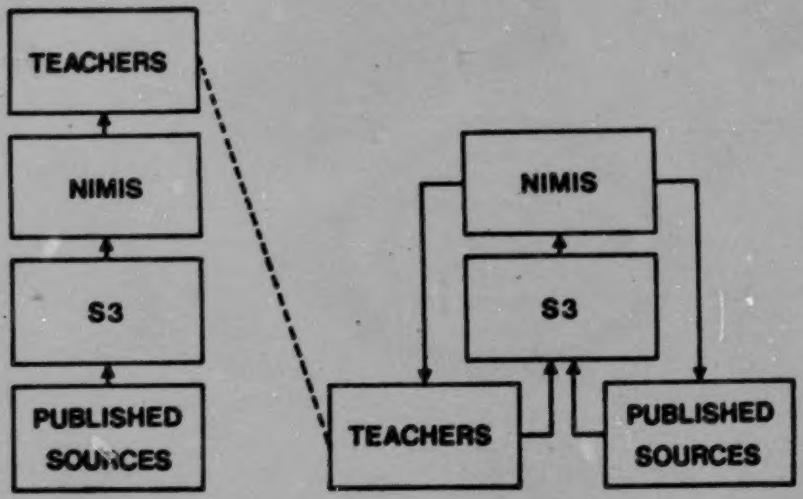

TEACHERS
NIMIS
S3
PUBLISHED SOURCES
NIMIS
S3
TEACHERS
PUBLISHED SOURCES

Figure 6. The Development of the Map

The campaign encouraged AAESPH members and nonmembers to submit information on materials to the nearest regional coordinator. Before it was submitted, the material was coded for appropriate learner characteristics, such as handicapping conditions, as well as other bibliographic data, such as the title of the material, publisher information, and the catalog and page number (Figure 7). In addition to bibliographic data, information on teacher-made material included a programmed lesson plan consisting of a statement of behavioral objectives, a list of items needed to implement the objectives, and a brief summary of how the material is to be used.

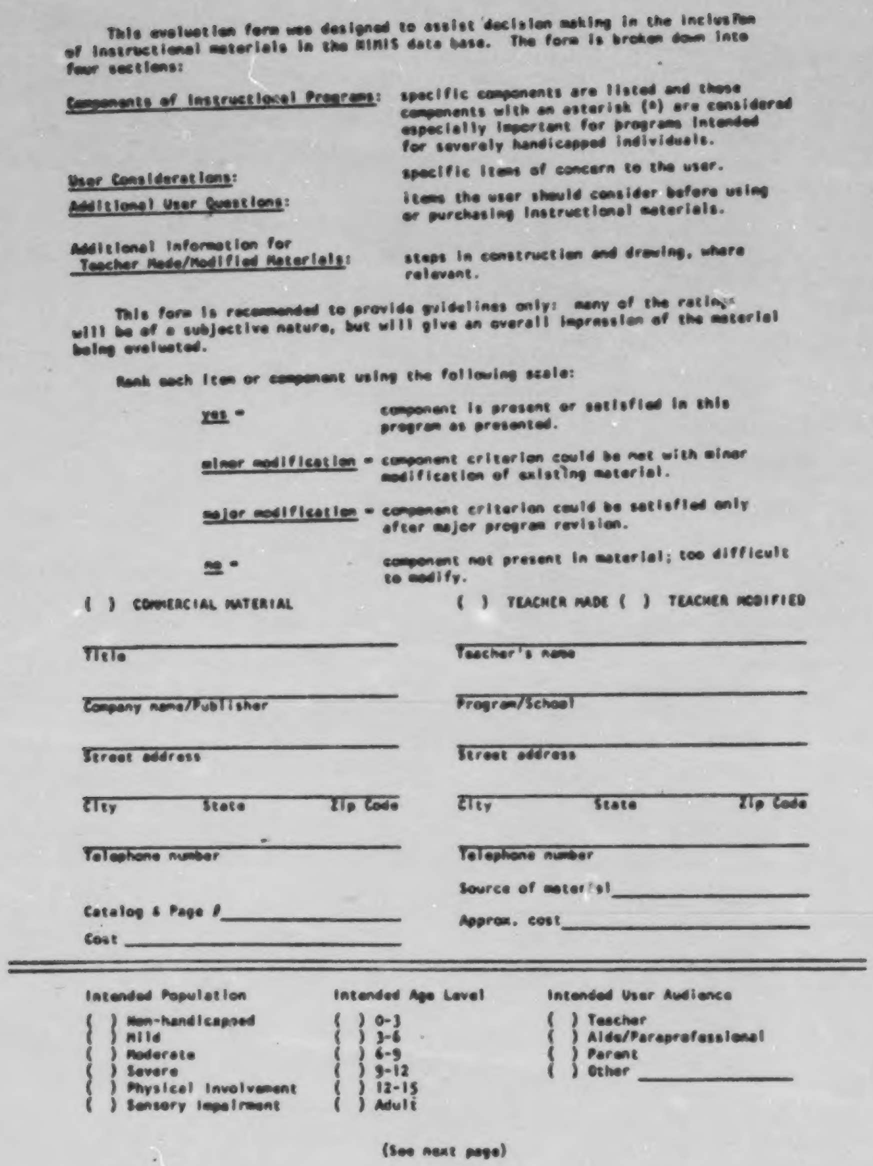
This information was forwarded to the regional coordinators who compiled data on the materials submitted, eliminated duplication, and forwarded the information to AAESPH national headquarters. The AAESPH staff further eliminated duplication and submitted a refined list of the recommended entries to S-3. This information was used to prepare abstracts and enter the materials into NIMIS, thus making them available to all users in the field.

Thus, professional organizations can meet some of the expressed needs of their members and serve as innovative catalysts for the development of new areas through the MAP. S-3 recommends that the Materials Accession Process, developed and initiated with AAESPH, be expanded to involve the experiences and expertise of professionals working with all types of handicapped individuals, thus updating and making more accountable the locate process.

Summary Strategy IID-01: Adapt adaptable materials which can be made to fit identified needs.

The work element of adapting adaptable materials which can be made to fit identified needs was intended to be one method for increasing the number of materials for particular groups of children with exceptional educational needs. Included in the workscope for this element was the task of assessing adaptation process alternatives to determine the most functional process for producing quality adaptations in a cost-effective and efficient manner. Other activities included implementing the selected adaptation process alternative and producing handicap-related adaptations.

Both the original proposal and the modified proposal submitted by the Wisconsin Research and Development Center for Cognitive Learning in 1974 stated that one goal of S-3 would be to generate a system to adapt materials to meet the identified needs of the S-3 population. The system designed to adapt instructional materials for the S-3 handicapped population was to have established mechanisms for (1) working cooperatively with NCEMMH and the ALRC Network to identify materials which need adaptation, (2) utilizing instructional materials information to determine adaptation specifications for identified needs, (3) adapting instructional materials according to the specifications to meet identified needs, and (4) reassessing adapted instructional materials to determine whether the adapted materials meet the specified needs of the S-3 population.



This evaluation form was designed to assist decision making in the inclusion of instructional materials in the NIMIS data base. The form is broken down into four sections:

Components of Instructional Programs:	specific components are listed and those components with an asterisk (*) are considered especially important for programs intended for severely handicapped individuals.
User Considerations:	specific items of concern to the user.
Additional User Questions:	items the user should consider before using or purchasing instructional materials.
Additional Information for Teacher Made/Modified Materials:	steps in construction and drawing, where relevant.

This form is recommended to provide guidelines only: many of the ratings will be of a subjective nature, but will give an overall impression of the material being evaluated.

Rank each item or component using the following scale:

yes =	component is present or satisfied in this program as presented.
minor modification =	component criterion could be met with minor modification of existing material.
major modification =	component criterion could be satisfied only after major program revision.
no =	component not present in material; too difficult to modify.

( ) COMMERCIAL MATERIAL

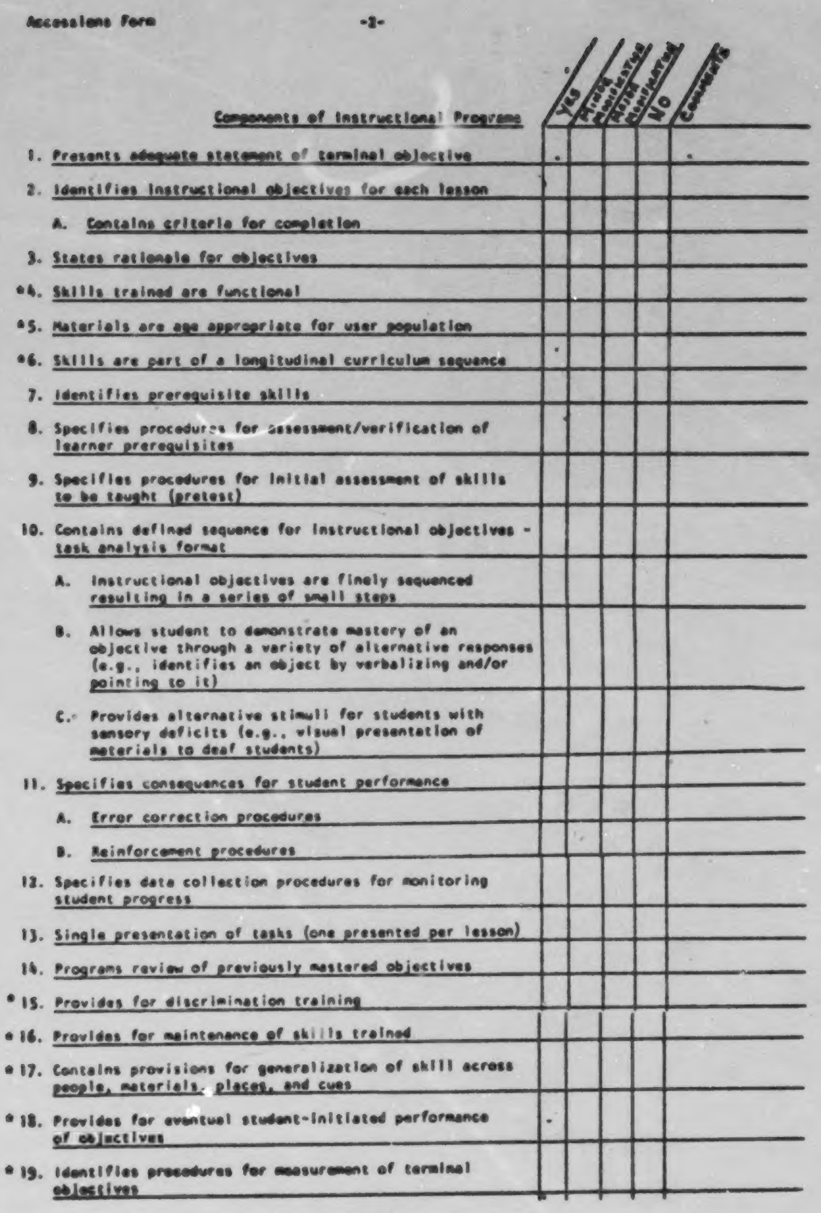
( ) TEACHER MADE ( ) TEACHER MODIFIED

Title	Teacher's name
Company name/Publisher	Program/School
Street address	Street address
City State Zip Code	City State Zip Code
Telephone number	Telephone number
	Source of material__________
Catalog & Page #__________	Approx. cost__________
Cost __________	

Intended Population	Intended Age Level	Intended User Audience
( ) Non-handicapped	( ) 0-3	( ) Teacher
( ) Mild	( ) 3-6	( ) Aide/Paraprofessional
( ) Moderate	( ) 6-9	( ) Parent
( ) Severe	( ) 9-12	( ) Other __________
( ) Physical Involvement	( ) 12-15	
( ) Sensory Impairment	( ) Adult	

(See next page)

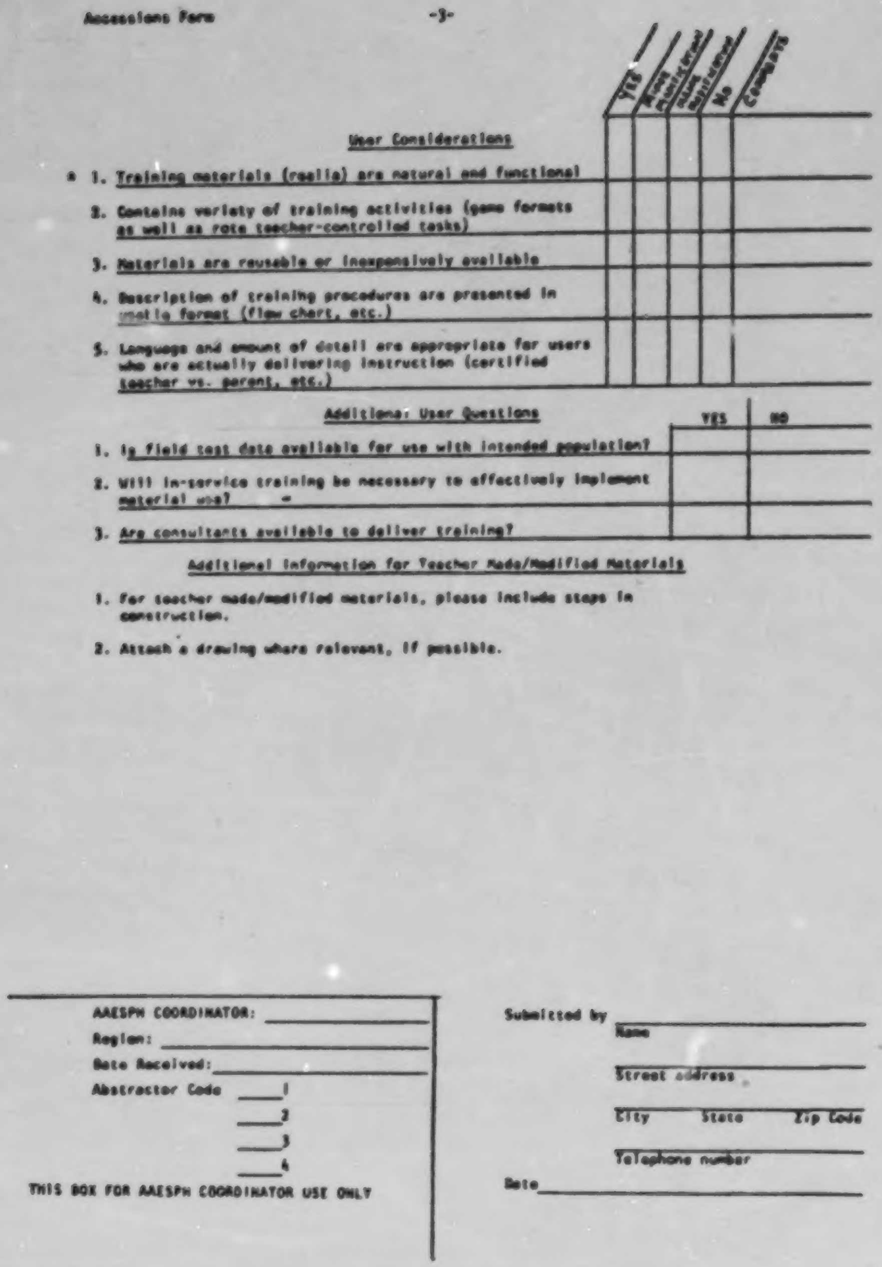
Figure 7. S-3/AAESPH Materials Accession Project Accessions Form



Accessions Form -2-

Components of Instructional Programs	Yes	Minor Modification	Major Modification	No	Comments
1. Presents adequate statement of terminal objective					
2. Identifies instructional objectives for each lesson					
A. Contains criteria for completion					
3. States rationale for objectives					
*4. Skills trained are functional					
*5. Materials are age appropriate for user population					
*6. Skills are part of a longitudinal curriculum sequence					
7. Identifies prerequisite skills					
8. Specifies procedures for assessment/verification of learner prerequisites					
9. Specifies procedures for initial assessment of skills to be taught (pretest)					
10. Contains defined sequence for instructional objectives - task analysis format					
A. Instructional objectives are finely sequenced resulting in a series of small steps					
B. Allows student to demonstrate mastery of an objective through a variety of alternative responses (e.g., identifies an object by verbalizing and/or pointing to it)					
C. Provides alternative stimuli for students with sensory deficits (e.g., visual presentation of materials to deaf students)					
11. Specifies consequences for student performance					
A. Error correction procedures					
B. Reinforcement procedures					
12. Specifies data collection procedures for monitoring student progress					
13. Single presentation of tasks (one presented per lesson)					
14. Programs review of previously mastered objectives					
* 15. Provides for discrimination training					
* 16. Provides for maintenance of skills trained					
* 17. Contains provisions for generalization of skill across people, materials, places, and cues					
* 18. Provides for eventual student-initiated performance of objectives					
* 19. Identifies procedures for measurement of terminal objectives					

Figure 7. S-3/AAESPH Materials Accession Project Accessions Form (Cont.)



Accessions Form -3-

User Considerations

	YES	Minor Modification	Major Modification	NO	Comments
* 1. Training materials (realia) are natural and functional					
2. Contains variety of training activities (game formats as well as rote teacher-controlled tasks)					
3. Materials are reusable or inexpensively available					
4. Description of training procedures are presented in usable format (flow chart, etc.)					
5. Language and amount of detail are appropriate for users who are actually delivering instruction (certified teacher vs. parent, etc.)					

Additional User Questions

	YES	NO
1. Is field test data available for use with intended population?		
2. Will in-service training be necessary to effectively implement material use?		
3. Are consultants available to deliver training?		

Additional Information for Teacher Made/Modified Materials

1. For teacher made/modified materials, please include steps in construction.
2. Attach a drawing where relevant, if possible.

AAESPH COORDINATOR: ______________
Region: ______________
Date Received: ______________
Abstractor Code ____1
____2
____3
____4
THIS BOX FOR AAESPH COORDINATOR USE ONLY

Submitted by ______________
Name
____
Street address
____
City State Zip Code
____
Telephone number
Date ______________

Figure 7. S-3/AAESPH Materials Accession Project Accessions Form (Cont.)

Many of the instructional materials which are currently available for use by teachers to instruct handicapped pupils were originally designed for normal children. Although some of these materials are useable with handicapped pupils, many could be made more effective by being modified or adapted.

FY-1

During the first year of funding, two systems were to have been developed and evaluated: (1) a materials adaptation system and (2) a materials development system.

The objectives for the development and evaluation of a materials adaptation system for the S-3 handicapped population were:

1. to devise, through cooperative efforts with NCEMMH and the ALRC Network, an adaptation system which is responsive to the national needs analysis;
2. to evaluate the extant Wisconsin R & D Center's materials adaptation system as an approach to adapting materials for the S-3 population, selecting certain curricular areas and handicapped subgroups as exemplars;
3. to modify, as appropriate, the Wisconsin R & D Center's adaptation system to meet the requirements for the adaptation of instructional materials for the mainstreamable within the S-3 handicapped population;
4. to modify, as appropriate, the Wisconsin Cerebral Palsy Communication Group's materials adaptation system to meet the needs requirements for the severely handicapped within the S-3 population;
5. to provide a responsive materials adaptation system for use in the adaptation of materials for the S-3 handicapped population.

S-3 planned to approach the development of the adaptation system by reviewing the literature on adaptation processes and locating any system designs which were currently in use. If none were found, a modification of the Baker and Schutz (1972) system for materials development was to have been formulated and used as a first draft model for the system.

The adaptation system was to be tested using one specific set of instructional materials and then evaluated, revised if appropriate, and used in adaptation efforts in subsequent years.

Following development of adaptation specifications, the materials comprising the Wisconsin Design for Reading Skill Development, DMP, the Prereading Skills Program, the IGM, and the IGE/MUS programs were to have been modified to reflect the specific needs of the handicapped population. These adaptation projects were discontinued in January 1975, when BEH decided to place a very high priority upon the development of NIMIS. The continuing delay in the NNA, which was to have provided needed data, was also a factor in this decision.

Also proposed for adaptation at this time were an interactive scanning and encoding communications aid for cerebral palsied individuals and a set of instructional materials for the language development of the severely and multiply handicapped child.

We Can Cook

At the end of the first project year it was proposed that the We Can Cook material be adapted, based upon data derived from expert appraisals of the material and teacher evaluations of the material acquired from the developer. In cooperation with the original developer, S-3 was to adapt the material to make it more effective in teaching basic cooking skills to the mentally retarded, learning disabled, and emotionally disturbed. The We Can Cook adaptation project was not continued beyond the initial evaluation phase because of the redeployment of resources to develop NIMIS.

FY-2

During the second contract year publishers were contacted for their recommendation of materials to be adapted. Adaptation activities were deferred until the new coordinator of materials adaptation and development joined the staff.

Here We Go

Here We Go was identified for possible adaptation during the fourth quarter of the second contract year. Here We Go is a toilet training program designed for developmentally delayed preschool children and directed to the parents and educators who work with this target group on a daily basis. Potential users of the program include the trainable mentally handicapped, educable mentally handicapped, and the mildy physically impaired.

The material was originally developed in 1971 as part of a research project at the Northwest Regional Special Education Instructional Materials Center. The program was submitted to S-3 in August 1976, by NCEMMH as a potential candidate for adaptation. A decision was made by S-3 to revise, update, and field test this toilet training program.

On August 27, 1976, NCEMMH presented S-3 with the original field test of the program and with the content evaluation that they had completed on the product. A search was made by S-3 staff for additional evaluative documents from the original authors of the program and from the director of the Northwest Regional Special Education Instructional Materials Center. This data provided substantive evidence of the need for the product and identified the target population and the objectives of the material.

FY-3

On September 14, 1976, a professional search of competitive toilet training materials was completed by S-3 and a child-use search was conducted by NCEMMH. No competitive child-use products were identified. Twenty professional resources on the subject of toilet training were located, accessed, and reviewed.

Initial meetings held to determine various aspects of the adapt effort included a meeting with the Wisconsin R & D Center Media Services staff to plan the format development of the product and to edit the content. Contracts were also made with an evaluator and photographer for the project.

On September 21, 1976, the first content revision of the toilet training program began. A preliminary timeline was formalized at this time and a request for approval to adapt the toilet training program was submitted to BEH with a budget of $14,155.63.

At the end of September 1976, the first revision of the toilet training program was completed and the text was edited by S-3 and NCEMMH. A decision was reached that the objectives could not be accomplished with the intended target population unless the product was refined substantially and revision was started. The second complete revision of the text was finished on November 24, 1976. The program was submitted for field validation to professionals who had dealt with members of the target population on a daily basis and who had experience in toilet training.

On February 7, 1977, the results of the developmental field test were received and the third revision of the program began. Concurrently, meetings were held with the S-3 content expert and the evaluator to construct the formal field test instrument and with the Center's Media Services staff to create a format design based on the third revision of the content. A shooting script for pictures needed to enhance the content was prepared and reviewed by the photographer. Upon locating a population for the photos and graphs, the prop shots for the program were completed. After approaching 30 school systems, a field test population was identified on March 22, 1977. The field test instruments were disseminated and pictures of the appropriate target population were taken. By May 10, 1977, all of the field test data were collected and analyzed (Appendix A) and the fourth and final revision of the program was begun.

On May 20, 1977, a decision was made by the coordinator of S-3 to split the toilet training program into two books: Toilet Training: How to Teach Your Developmentally Delayed Child and Handwashing and Other Related Toileting Skills: How to Teach Your Developmentally Delayed Child, and a final revision was done (Appendix B). The program is to be published by McGraw Hill in the spring of 1978.

Guidance Associates

Guidance Associates and S-3 began discussions in August 1976, about the possibilities of adapting Guidance Associates materials for use with children with exceptional educational needs. Six Career Discoveries filmstrips were selected for adaptation. It was agreed that S-3 would:

1. Screen the six filmstrips to determine what each was intended to do and whether each accomplished its instructional purpose.
2. Review the overall program, indicating the size of the target handicapped population; identifying demographic data regarding the target populations, prioritizing target population possibilities; and identifying and reporting competitive products.
3. Determine substantive and instructional design changes in
    a. instructional objectives
    b. comprehension level
    c. entry level skills
    d. evaluation instruments
    e. independent learning instructions
    f. skill progression
    g. motivational factors
    h. interest and instructional levels
    i. adaptability for group size
    j. percentage of active student involvement
    k. inherent reinforcement
4. Recommend specific program components to be adapted, including identification of additional materials, media, manipulatives needed, and specification of changes to be made in
    a. discussion guides
    b. filmstrips
    c. records/tape cassettes
    d. teacher's guides
    e. manipulative materials

On October 21, 1976, the Career Discoveries materials were previewed by the S-3 staff. After a review of the materials, an ERIC search and a NIMIS search for comparable products were undertaken. An interview with Mr. Jim Laurence of Project SKILL, a federally-funded vocational training and placement program for educable mentally handicapped persons, and a pilot test of the original materials with 12 to 15 year old students at St. Coletta's, a private educational and residential institution, provided additional input into the proposed adaptation.

A plan for adapting Career Discoveries was finalized on November 4, 1976 (Appendix C). It was determined that the existing materials, with the exception of two filmstrips, were inappropriate for the EMH students in grades five through nine, necessitating the alteration of the content and learning activities. A prototype set of four filmstrips was proposed which included one introductory filmstrip and three specific food service related careers. Each filmstrip was based on a "day-in-the-life" format which would provide a constant temporal referent for the student. Revisions included the addition of behavioral objectives, assessment instruments, worksheets, pre- and post-activities, a prototypic teacher's guide, suggestions for additional filmstrips, and a rationale for such changes and additions including a detailed description of learner characteristics.

The Wisconsin Research and Development Center's Media Services staff provided assistance in designing and editing the final report as well as in preparing a "dummy" copy to supplement the prototypic teacher's guide. Two copies of the evaluation of the Career Discoveries filmstrips were sent to Guidance Associates on November 17, 1976.

In January 1977, a conference call was conducted between executives of Guidance Associates and the S-3 staff to determine what modifications were needed in the adaptation product to bring the proposal to contract specifications. Proposed modifications included:

1. A new filmstrip representing an appropriate career for mildly educationally handicapped students for each of the six career clusters;
2. Revision of each of the six introductory filmstrips to include information about the proposed additional career;
3. Activities appropriate for a variety of learner abilities and interests to accompany each of the thirty filmstrips.

Guidance Associates responded on February 28, 1977, requesting additional clarification of the proposed adaptation model prior to formal contracting. No agreement was reached, however, and a decision was made to discontinue the project.

Paramount Oxford Films

S-3 was contacted in early September 1976, by the Paramount Oxford Film Company about the possibility of S-3 adapting some of Paramount Oxford's existing materials for use with children with exceptional educational needs. It was agreed that S-3 would review the Paramount Oxford film catalog, determining films with potential for adaptation; would preview identified films; would suggest objectives and content for study guides to accompany the films; would provide marketing data for the films; and would participate in field testing of the adapted product.

Paramount Oxford, in turn, proposed to adapt existing Paramount Oxford films for use with learning disabled children and to provide all creative and technical personnel for the film adaptation project. Specific activities to be undertaken included:

1. Reviewing and selecting from existing films.
2. Screening--pilot testing films with learning disabled children to ascertain comprehension levels.
3. Producing simplified sound tracks for the films.
4. Re-examining comprehension levels in a field test of the simplified films.
5. Revising and rewriting the scripts to accommodate the needs of learning disabled children.
6. Designing and outlining study guides to accompany each film.
7. Preparing and writing study guides.
8. Packaging and disseminating the newly adapted versions of the films with study guides.

Paramount Oxford further proposed to develop a series of 11-minute films targeted toward emotionally disturbed children. The new films were intended to be a "child-centered, affective, motivational program" which would stimulate a discussion of personal feelings, interpersonal relationships, and methods for expressing feelings positively. Accompanying study guides were proposed to further individualize film use according to emotional handicap, age, and comprehension level. Specific activities to be undertaken included:

1. Needs assessment of high priority areas for film development.
2. Development of film content outlines and objectives.
3. Preparation of scripts.
4. Production of 16mm color sound films.
5. Field tests of films with representative target audiences.
6. Design and outline of study guides.
7. Preparation and writing of study guides.
8. Packaging and dissemination of films and accompanying study guides.

S-3 responded to Paramount Oxford's proposal by screening five Paramount Oxford Films and selecting one, "Yes-No, Stop-Go," as an initial adaptation possibility. Recommendations for "Yes-No, Stop-Go" included:

1. Adapting the sound track to a more rhythmic dialog pattern.
2. Adding a visual recognition sequence to the beginning of each section of film to reinforce learning of the target words.
3. Pairing learned visual word patterns with their auditory representations.
4. Adding viewer participation opportunities and activities.
5. Developing supplementary materials such as study prints, ditto masters, and game suggestions.

"The Big Red Barn" and "The Dot" were also reviewed and recommendations were made for sound track adaptation.

Paramount Oxford responded to the S-3 recommendations with the suggestion that a new film be produced utilizing the content of the original film, "Yes-No, Stop-Go." Cost factors for development were anticipated to be equivalent to adapting the existing product. The budget for one 11-minute film was estimated at $46,200.00

Mr. J. Harritt responded in November 1976, on behalf of S-3, informing Paramount Oxford that S-3 was unable to provide money to publishers and producers for adaptation projects but was able to support such projects through S-3 contributions of consulting and staffing. Further cooperation between Paramount Oxford and S-3 was made contingent upon project renewal in 1977.

Exer-Cor

The fourth product considered for adaptation during the 1976-1977 project year was the Exer-Cor machine. Mr. Don Brown of Visualized Instructional Productions, Limited, in Oak Brook, Illinois, contacted S-3 in early November 1976, requesting assistance in the development of a program to utilize the Exer-Cor with children with exceptional educational needs.

Exer-Cor is a 4 foot long, 14 inch wide mechanical apparatus which can be adjusted to facilitate several exercise patterns intended to aid in the rehabilitation of individuals with cardiovascular, respiratory, musculatory, and neurological disorders. The machine is adjustable in size for use with individuals from preschool through adult ages. Exercise patterns include simulated cross lateral creeping and crawling, jogging, pushing, and balancing, all provided in repetitive, rhythmic, serialized movements.

Mr. Brown identified the following necessary components of his planned Exer-Cor program:

1. A manual to describe the functions, scope, and limitations of the Exer-Cor machine.
2. A comprehensive teacher's guide delineating a scope and sequence of tasks and activities to be used with the machine.
3. Permission and data collection forms for parental, medical, and educational use.
4. Filmstrip script copy targeted toward the training of paraprofessionals to aid teachers in using the Exer-Cor machine with their students.

S-3 responded to Mr. Brown's request with a proposal to adapt the Exer-Cor for use with children with exceptional educational needs. While awaiting acceptance of the S-3 proposal by Visualized Instructional Productions, a materials adaptation specialist was assigned to evaluate the Exer-Cor according to standard instructional material characteristics and to review the literature relating to the use of such patterning equipment with handicapped children. The evaluation report (Appendix D) suggested that it would be impractical for S-3 to engage in an adaptation of the Exer-Cor given staff expertise and skills. Visualized Instructional Productions was notified of the S-3 decision not to become involved in the adaptation of the Exer-Cor and the anticipated contract was not formalized.

I Can

Dr. Janet Wessel of Michigan State University approached S-3 in November 1976, about the possibility of cooperatively working on the model to adapt instructional media and materials to meet the needs of children with exceptional educational requirements. The model, when developed, would be used to adapt I Can for use with severely emotionally involved and autistic children aged five to seven years. S-3 agreed to work with MSU in perfecting the adaptation model which would help anticipate and correct some of the difficulties faced in adapting Here We Go.

I Can is a physical education program for children with exceptional educational needs developed with funds from the Bureau for Education of the Handicapped by the Field Service Unit for Physical Education and Recreation for the Handicapped, Department of Health, Physical Education, and Recreation, Michigan State University. The I Can program is an individualized instructional system designed to help teachers provide appropriate programming for trainable and severely mentally retarded children by assisting them to:

1. define a comprehensive physical education program;
2. assess students' needs;
3. prescribe instructional activities;
4. teach an individualized physical education program;
5. record and report continuous progress; and
6. evaluate student change and program implementation.

The I Can instructional materials include games and teachers' guides for four curricular areas: fundamental motor skills, body management, health and fitness, and aquatics. The I Can materials also include performance objectives, criterion-referenced assessment instruments, and sequenced and prescriptive instructional activities.

MSU submitted a formal proposal to S-3 in December 1976, to develop the adaptation model with accompanying instrumentation; to adapt and pilot test I Can with severely emotionally impaired (SEI) and autistic children; and to train participating teachers to implement and evaluate the materials. Major tasks specified in the subcontract included:

1. development of an instrument for determining adaptation requirements for each component for the I Can instructional system;
2. selection of I Can materials for pilot testing;
3. training teachers to implement the I Can system;
4. collection of formative review data from teachers regarding material revision; and
5. preparation of revised materials for field testing.

Data indicate that physical education programs can improve the motor patterns of severely emotionally disturbed students, as well as enhance their perception of their own body and its capabilities, and improve their posture, strength, and general health. It is hypothesized that the opportunity to experience success in completing concrete tasks which physical activity affords may also enhance the SIE/autistic student's personal adjustment. Carefully structured physical education may permit a developing awareness of others and encourage positive peer interactions among SEI/autistic children.

The I Can program was evaluated by S-3 according to the Standard Selection Criteria and was found to have good adaptive potential. A NIMIS search produced no available alternative materials appropriate for use with the SEI/autistic population. A decision was made by S-3 to continue to interact with the MSU staff in the proposed adaptation project.

The emotionally involved target populations were selected for the material adaptation project because, under the mandate of Public Law 94-142, many SEI/autistic students enter educational programs without having had systematic instruction in psychomotor skill areas. MSU presented a rationale for this adaptation project which reviewed a survey of programs for the SEI/autistic in the State of Michigan,[1] revealing that while most existing physical educational programs for these students have adequate facilities and equipment, they do not employ physical education specialists and do not offer well-planned instruction. Under PL 94-142 teachers and their administrators are charged with providing full educational services for their SEI/autistic students, including appropriate physical education and recreation programs.

A subcontract with MSU for $18,423 was signed in January 1977, which specified that the adaptation model would be finalized in February 1977, the I Can materials adapted in March 1977, and the revised I Can program pilot tested by June 1977. Materials were to be further revised during July and August in preparation for a final field test in September 1977.

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[1] This survey was conducted by Fran Barger, Jody Smith, and Cindy Montgomery, graduate students in the Severely Emotionally Impaired/Autistic Teacher Training Program at Michigan State University, for the Michigan Department of Education. A written report of the survey results is available from the Michigan Department of Education.

The pilot test was conducted with teachers and students at the Wayne County Developmental Learning Centers, in Southgate and Redford, Michigan, which provide day programs for approximately 60 severely emotionally impaired, autistic, and autistic-like students aged 4 to 22 years in two former elementary school buildings. A report of the pilot test results appears in Appendix E.

Wisconsin Consortium for the Preparation of Regular Educators for Participation in the Education of Handicapped Children

The sixth adaptation product considered during the third year was The Wisconsin Consortium for the Preparation of Regular Educators for Participation in the Education of Handicapped Children Series distributed by Midwest IGE Services. The series included a set of 14 multimedia modules designed to introduce regular educators to the model and processes of mainstreaming children with exceptional needs into regular classrooms. The modules, which were intended to develop initial awareness, included a video tape, selected readings, transparencies, and pre- and post-tests for each level.

S-3 was provided with reader review data done by Midwest IGE Services from the Milwaukee Public Schools Pupil Programming Resources Center which included suggestions for modification of format, activities, and presentation. A request for approval to permit S-3 to adapt the Midwest IGE series was submitted to BEH in March 1977. The request sought permission to revise the 14 existing modules as well as produce a 15th module designed to focus the awareness of regular educators on NIMIS and the Learning Resource Center (LRC) Program. The primary responsibility of S-3 was to utilize its expertise in the education of individuals with exceptional needs to make any necessary modifications or additions to the program content. Midwest IGE Services agreed to review the product content primarily from the viewpoint of inservice training techniques and marketability. The projected completion date for submission of the revised modules to BEH was the end of August, 1977.

While awaiting approval from BEH, a sample module, PL 94-142 and The Classroom Teacher, was prepared informally and field tested with a group of regular educator administrators in a workshop at Lakeland College in Sheboygan, Wisconsin. Over half of the participants were receptive to the content of the module and contributed feedback as to how this module could best be used.

The project was discontinued after the BEH evaluation because the modules were viewed as "mediated training" instead of "training for media competencies."

Music and the Handicapped Child

Music and the Handicapped Child was recommended in February 1976, as a possibility for adaptation for use with groups of children with exceptional educational needs by Ms. Jane Walline, Coordinator of the

Great Lakes Area Learning Resource Center in Lansing, Michigan. The developer, Theresa Goodell, sought financial support to refine the program, evaluate its effectiveness, and disseminate the completed music curriculum materials to special education programs.

The original materials were developed in a Title III project to facilitate the acquisition of sensory and perceptual motor skills through music and movement experiences. The goals of the project included:

1. Providing a model of demonstration classes and curriculum materials suitable for replication in programs for children with exceptional educational needs.
2. Validating a music and movement curriculum for the mentally handicapped.
3. Integrating music and movement activities with other curriculum areas as an integral part of the process of learning rather than as a performance oriented product.
4. Developing additional curriculum materials, lessons, and methods suitable for a program of music and related activities for public school classes for children with mental and physical handicaps.

A search of the computer records of NIMIS indicated that few developmental music and movement programs were commercially available. A file of nearly 50 letters of review and support for the described music program from teachers in the field was presented by the developer to establish a need and acceptance of the materials among teacher users.

The Music and the Handicapped Child program was reviewed by S-3 in April 1977. Material characteristics were evaluated and Ms. Goodell was notified that her product would be considered as an adaptation product for the fall 1977 workscope, contingent upon project renewal.

Adapting Instructional Materials

In lieu of pertinent information still not available as a result of continuing delays in the NNA, activities of S-3 in the adaptation area during FY 1975 and FY 1976 primarily involved the identification of materials in need of adaptation to make them more appropriate for use with the handicapped population served. As a part of the process of reviewing instructional materials for description and entry into NIMIS, adaptation recommendations were made for those materials identified as being in need of adaptation. If the NNA is ever conducted, the data obtained should facilitate decision making about adaptation and development prospects.

An analysis of problems encountered in adapting and evaluating the initial products reinforced the necessity of devising a systematic process to be followed uniformly in all projects, as was planned in the initial proposal. Needed was a model which could be used to identify those media and materials which offered the most appropriate, effective, and practical instructional experience for the child with exceptional needs and which provided guidelines for modifying the material. Adapting Instructional Materials (AIM), was developed at S-3 in November 1976, to meet this need and was applied to several subsequent S-3 material adaptation projects. AIM is a systematic model for integrating desired educational outcomes and objectives with the individual characteristics of each learner. The model is based upon a diagnostic prescriptive instructional management system which assumes that for optimal effectiveness materials must be appropriately geared to each learner's achievement level and rate of acquisition, as well as to essential curricular objectives. The model involves: (1) matching existing instructional materials against standard material, teacher, and learner characteristics; (2) assessing the appropriateness of the material to meet the stated need by soliciting reader reviews from teachers currently working in the target field; and (3) integrating this data into a statement of needed changes in the methodology, format, or content of the material. The AIM model comprises a six-step process (Figure 8).

The first of six phases in the adaptation process involves selecting a product (Figure 9). Materials to be adapted are identified in two ways; teacher report of need via the S-3 materials accessions process (MAP) and teacher or publisher report of the need to change specific aspects of a given material to heighten its usefulness with specific populations. Once identified, a search is made of the National Instructional Materials Information System (NIMIS) data base. The resultant information is reviewed to determine the availability of appropriate products. Items located through NIMIS are matched against items reported through MAP to determine their actual use in the field and to provide evidence of need for product adaptation.

The second phase (Figure 10) of the adaptation process includes an assessment of the product according to available field test data or product reviews from professional literature. The actual product is then evaluated according to material characteristic standards. The standards for material characteristics include format factors such as media characteristics, durability, sequence of task for progressions; method factors such as mode of presentation, size and type of class grouping, temporal contingencies, and mode of response; and content factors such as goals and objectives, performance measures, and instructional and interest levels. Assessments of the relevant characteristics of the target teacher and learner populations are also conducted based upon a review of relevant literature concerning the target population and the assessed perceptions of target group teachers in the field. Teacher characteristics assessed include presentation behavior, response behavior, and organizational behavior. Learner behavior patterns such as physical characteristics, cognitive style, and behaviors of attention, response, and social interaction are also assessed. Further recommendations and suggestions are gathered from the reviews of teachers in the field. Needs assessment data, the NIMIS search, the evaluation of material characteristics, and the review of reported learner and teacher characteristics are collated.

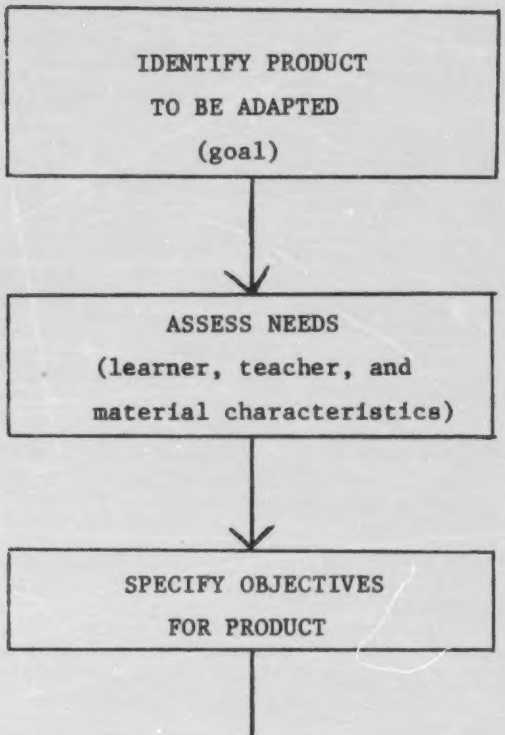

IDENTIFY PRODUCT
TO BE ADAPTED
(goal)
ASSESS NEEDS
(learner, teacher, and
material characteristics)
SPECIFY OBJECTIVES
FOR PRODUCT
SELECT INSTRUCTIONAL
STRATEGIES, ACTIVITIES,
MEDIA AND MATERIAL
CHARACTERISTICS
DEVELOP MATERIAL
EVALUATE
(pilot test-field test)

Figure 8. Adapting Instructional Materials (AIM)

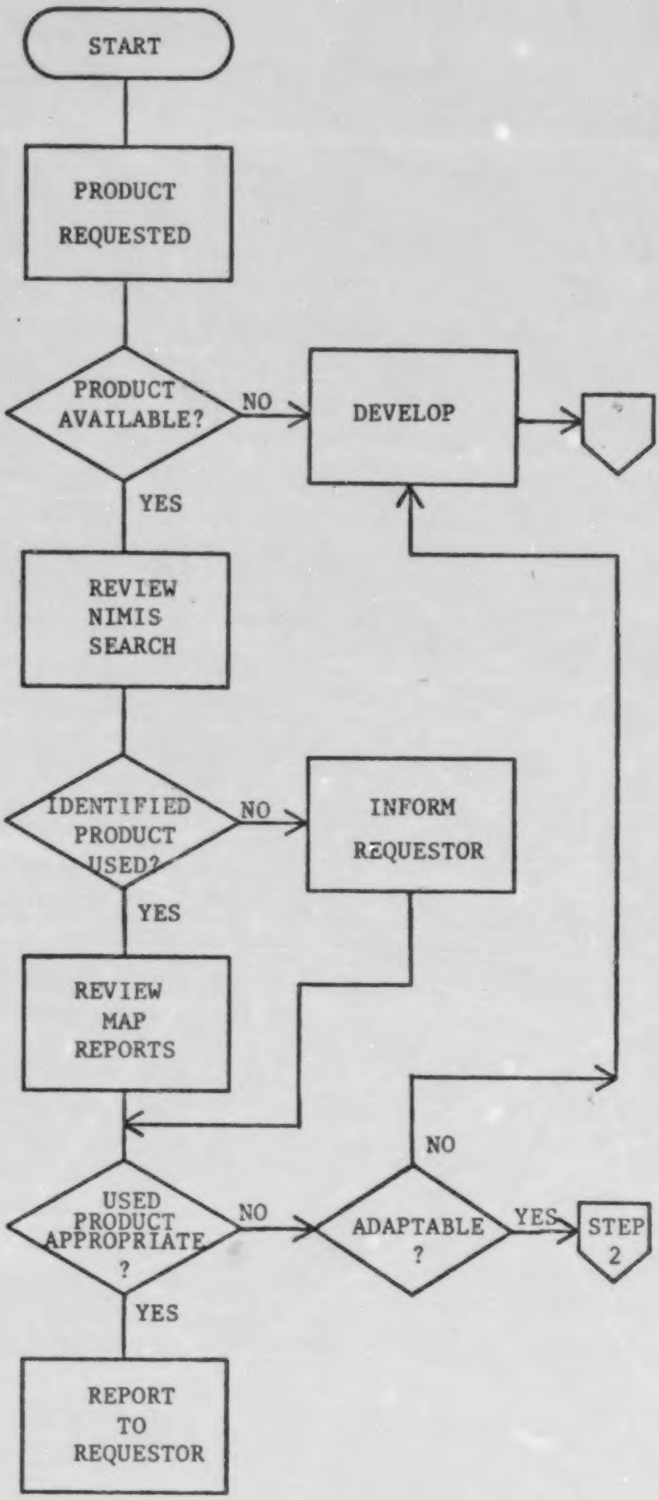

START
PRODUCT REQUESTED
PRODUCT AVAILABLE?
NO
DEVELOP
YES
REVIEW NIMIS SEARCH
IDENTIFIED PRODUCT USED?
NO
INFORM REQUESTOR
YES
REVIEW MAP REPORTS
NO
USED PRODUCT APPROPRIATE ?
NO
ADAPTABLE ?
YES
STEP 2
YES
REPORT TO REQUESTOR

Figure 9. Adapting Instructional Materials (AIM): Phase 1

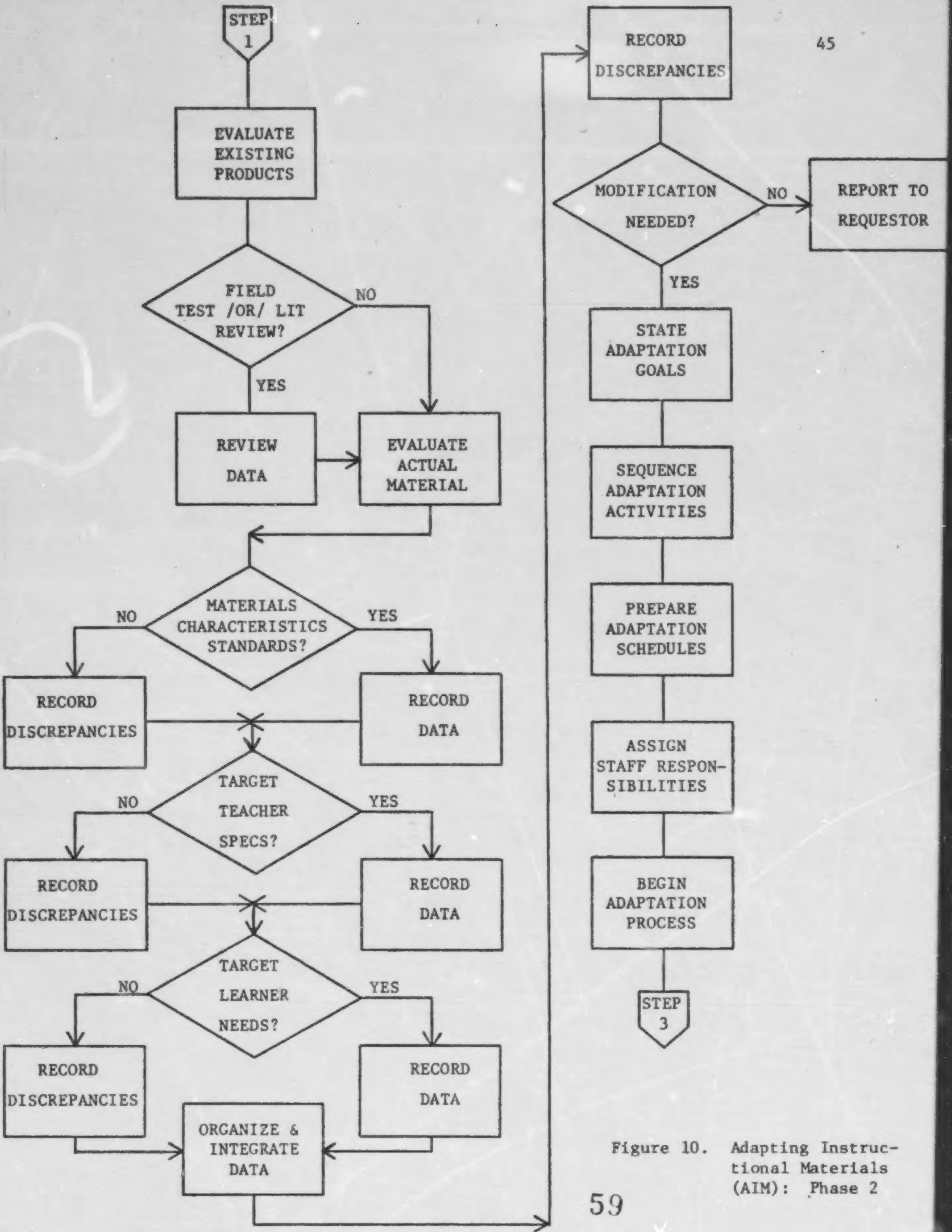

STEP 1
EVALUATE EXISTING PRODUCTS
FIELD TEST /OR/ LIT REVIEW?
NO
YES
REVIEW DATA
EVALUATE ACTUAL MATERIAL
MATERIALS CHARACTERISTICS STANDARDS?
NO
YES
RECORD DISCREPANCIES
RECORD DATA
TARGET TEACHER SPECS?
NO
YES
RECORD DISCREPANCIES
RECORD DATA
TARGET LEARNER NEEDS?
NO
YES
RECORD DISCREPANCIES
RECORD DATA
ORGANIZE & INTEGRATE DATA
RECORD DISCREPANCIES
MODIFICATION NEEDED?
NO
REPORT TO REQUESTOR
YES
STATE ADAPTATION GOALS
SEQUENCE ADAPTATION ACTIVITIES
PREPARE ADAPTATION SCHEDULES
ASSIGN STAFF RESPONSIBILITIES
BEGIN ADAPTATION PROCESS
STEP 3

Figure 10. Adapting Instructional Materials (AIM): Phase 2

A description, integrating information about the target learner, the desired behavioral outcomes, the desired teacher and environmental conditions, and the criterion level of success, is prepared. This integrated strategy facilitates the determination of specific goals for the materials adaptation and the sequencing of appropriate activities which promote reaching the goals. A production schedule is prepared and staff responsibilities assigned according to the integrated strategy and activity sequence.

The third phase (Figure 11) is the goal setting phase and includes identifying the terminal performance objectives and specific learner objectives for the material with a target user population.

The planning phase (Figure 11) includes the development of appropriate performance criteria. Specifications of instructional strategies and procedures most appropriate for meeting each objective with the target audience also highlight the fourth phase. Other activities in the planning phase include selecting alternative media and material formats while considering publisher requirements of economy, manageability, and effectiveness. The planning phase also includes exploring possible marketing strategies and designing the pilot and field test procedures.

The fifth phase (Figure 12) is the development of prototype materials and includes informal evaluations by professional and field readers. This step is culminated by the production of revised materials and a technical training manual.

The final phase (Figure 12) includes the evaluation activities of pilot and field testing. Teachers in the field can thus provide additional input into the format, content, and methodology of the instructional material.

S-3 recommends continued use of a systematic adaptation and development process such as that described.

Summary Strategy IIE-01: Develop needed materials which are unavailable and unadaptable and "unattractive" to commercial developers.

This workscope directed S-3 to review national needs assessment data, identify material needs, and establish priorities by handicapping condition; to structure specifications and plans for implementing a development process; and to develop and disseminate instructional materials. S-3 originally proposed generating a system to develop instructional materials to meet the identified needs of the S-3 population, establishing mechanisms for (1) working cooperatively with NCEMMH and the ALRC network to identify the needs specifications of the instructional materials which have a high development priority for the S-3 population, (2) developing instructional materials according to the needs specifications for the S-3 population, and (3) assessing newly developed instructional materials to determine whether they meet the specified needs.

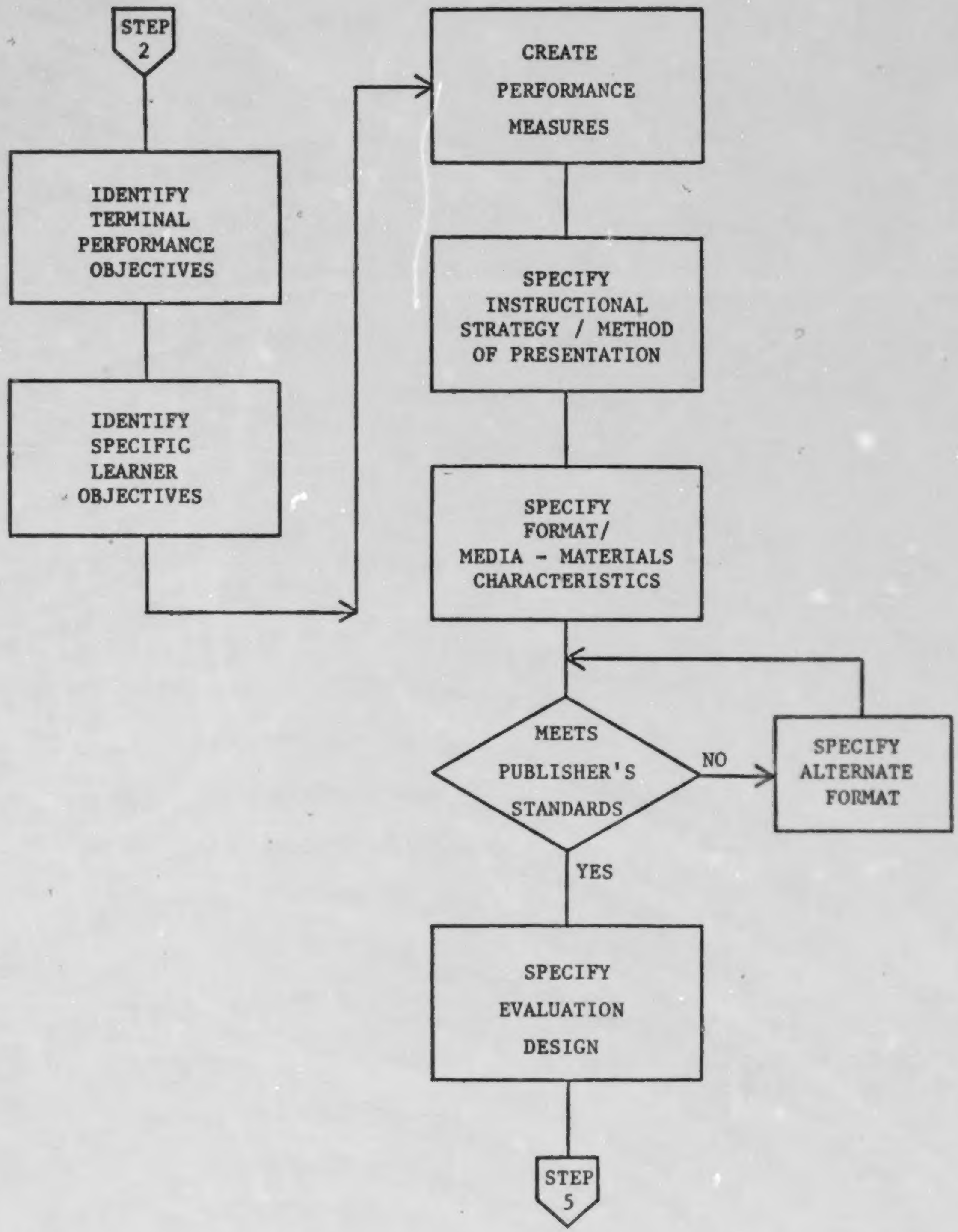

STEP 2
IDENTIFY TERMINAL PERFORMANCE OBJECTIVES
IDENTIFY SPECIFIC LEARNER OBJECTIVES
CREATE PERFORMANCE MEASURES
SPECIFY INSTRUCTIONAL STRATEGY / METHOD OF PRESENTATION
SPECIFY FORMAT/ MEDIA - MATERIALS CHARACTERISTICS
MEETS PUBLISHER'S STANDARDS
NO
SPECIFY ALTERNATE FORMAT
YES
SPECIFY EVALUATION DESIGN
STEP 5

Figure 11. Adapting Instructional Materials (AIM): Phases 3 and 4

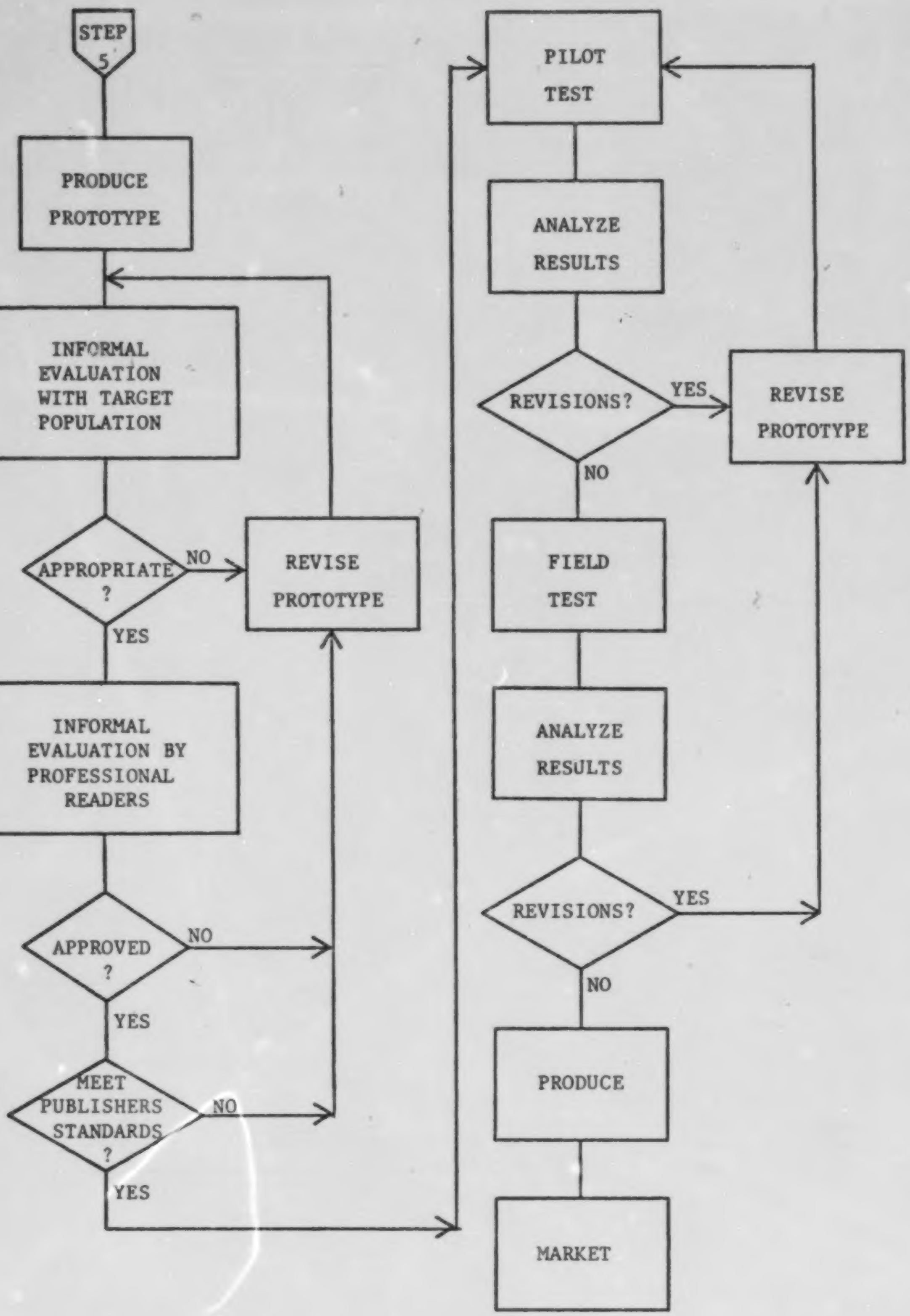

STEP 5
PRODUCE PROTOTYPE
INFORMAL EVALUATION WITH TARGET POPULATION
APPROPRIATE ?
NO
REVISE PROTOTYPE
YES
INFORMAL EVALUATION BY PROFESSIONAL READERS
APPROVED ?
NO
YES
MEET PUBLISHERS STANDARDS ?
NO
YES
PILOT TEST
ANALYZE RESULTS
REVISIONS?
YES
REVISE PROTOTYPE
NO
FIELD TEST
ANALYZE RESULTS
REVISIONS?
YES
NO
PRODUCE
MARKET

Figure 12. Adapting Instructional Materials (AIM): Phases 5 and 6

During the first program year S-3 contracted with the Cerebral Palsy Communication Group (CPCG) to develop a prototype eye tracking system (Appendix F). No developmental activity was performed for this workscope during the second or third year. A process for adapting and developing instructional material to meet the needs of children with exceptional educational needs was created during the third contract year (see Summary Strategy IID).

Summary Strategy IIF-01: Field test newly-developed extant materials for effect on learner-target.

The activities of this workscope were intended to help determine the utility of materials developed for use with children with exceptional educational needs. One of the S-3 activities originally proposed under this workscope was to develop and test a total assessment system to evaluate instructional materials for use with members of the S-3 handicapped population. The modified S-3 proposal of May 9, 1974, suggested that the Individually Guided Education field test network processes, study designs, measurement techniques, and data collection procedures be used. In addition, an ALRC field test network was to have been developed in a parallel manner.

The first products to be tested were the Vox Com (Appendix G) and the Auto-Com. The 1973-1974 preliminary evaluation of the Auto-Com was conducted in spring 1974. Eight children from seven different educational institutions in Southern Wisconsin and Northern Illinois were chosen to participate in the preliminary evaluation. At the termination of this program, three children were using portable Auto-Coms and five were using stationary Auto-Coms. The formal field test of the Auto-Com was completed in 1975 (Appendix H).

In October 1976, field validators were selected for the Here We Go program, a field validation instrument was designed, and, on November 27, 1976, the instrument and the text of the materials were disseminated to the professional field readers. A proposal was submitted to the Madison Public Schools for clearance to use a population in the school system for the formal field test. The proposal was approved, but it was found that no members of the target population within the school system were being toilet trained at that time.

On February 7, 1977, the results of the professional evaluation were received, reviewed, and collated. A third revision of the program was begun to incorporate numerous suggestions from the professionals completing the developmental field test. The recommendation suggested making the program more specific and reducing the vocabulary level to meet the needs of the parents who were to direct the target group. A decision was also made to break the field test instrument into two parts, heightening its reliability by allowing for comparisons of answers to parallel questions.

Field test populations were identified by March 22, 1977. Three children were located by the Area Learning Resource Center (ALRC) in Maine, one by the ALRC in New Jersey, and nine by the Marquette-Alger Intermediate School District in Michigan. Contacts were made with the field test populations by phone during the test administration to answer any questions from the professionals and families involved, and to check on progress.

By May 10, 1977, all of the field test data were analyzed and the fourth and final revision of the toileting program was begun. The collation of the formal field test data produced the following findings: 13 participants were initially committed to begin the field test, 5 participants completed the field test, 8 sent in final data even though the test was not complete. Of the five participants who completed the field test, only one child was completely trained by the time that the final data were submitted. Other children made significant gains but were not completely trained.

The field test showed that parent enthusiasm is a key factor in toilet training success, that knowing a child's toileting schedule is very important, and that a straight-forward format of program presentation which emphasizes clarity and brevity is vital to program effectiveness (Appendix I).

Based upon developmental field test data the product was revised, divided into two books, Toilet Training: How to Teach your Developmentally Delayed Child and Handwashing and other Related Toileting Skills: How to Teach your Developmentally Delayed Child, and submitted to NCEMMH for publication.

Summary Strategy IIIV-01: Lend expertise by handicapping condition.

This workscope involved providing technical assistance in the selection and use of media materials for children with exceptional educational needs and conducting training sessions for the ALRCs. S-3 responded to this workscope by locating a production facility for the Mid-East Learning Resource System, consulting with the Kentucky ALRC on media training production, and estimating production costs for LRC units.

Summary Strategy IIIV-01-2: Conduct training sessions for ALRCs.

This strategy was designed to provide information and training on improved strategies and techniques in the selection and utilization of media and materials by giving two information and training workshops for ALRC personnel. The staff of S-3 was to work cooperatively with the staffs of S-1 and S-2 to develop and present two workshops for ALRC staff on specialized and innovative techniques and strategies for the selection and use of instructional media and materials with handicapped students. Procedures were to be provided for training others in the utilization of these techniques and strategies. The schedule of events proposed to carry out this strategy were:

1. Meet with S-2 to plan first training workshop--to be completed September 30, 1976.
2. Conduct first training workshop--to be completed October 30, 1976.
3. Meet with S-1 to plan second training workshop--to be completed November 30, 1976.
4. Conduct second training workshop--to be completed December 30, 1976.

The first training session was to focus on the selection, utilization, and adaptation of instructional media and materials for the severely, profoundly, and multiply handicapped. The output of the session was to be a packaged workshop which could easily be implemented by the attending trainee upon return to his or her region. The second training session was to focus on the training of regular educators in the use, selection, and adaptation of instructional media and materials for mildly handicapped students who are being mainstreamed into the regular class.

The training workshop for ALRC members was carried out October 11-15, 1976, at S-2 at the Barkley Memorial Center, University of Nebraska. S-3 was in charge of the first two and one-half days and S-2 was in charge of the remaining sessions. The S-3 portion of the workshop was organized to provide participants with basic information on:

1. Instructional programming for the severely, profoundly, and multiply handicapped.
2. Criteria for evaluating and selecting instructional materials for the severely, profoundly, and multiply handicapped.
3. Suggested materials and equipment for the severely, profoundly, and multiply handicapped.
4. Examples of instructional materials/media which are appropriate for the severely, profoundly, and multiply handicapped.

With the assistance of three consultants, Charles Hedbring, Carole Holmes-Price, and Gordon Beil of Edmark Associates, a variety of materials, methods, programs, and techniques were presented. These included presentation and utilization of:

1. Project More
2. The Edmark Reading Program
3. The Alpern & Boll Parent Inventory
4. The Badger Books

A retrieval printout of 237 items presently in NIMIS on the severely, profoundly, and multiply handicapped and a media kit developed by S-3 were also shared with participants. Evaluation of the workshop by participants was favorable. Participants expressed a need for more training in instructional techniques in the utilization of the media presented. Several requests were made for additional media kits at the workshop and orders were received from participants for more of the kits later in the year (Appendix J). The second training workshop was not conducted.

Summary Strategy IIIW-01-1: Provide assistance in the design and production of training materials.

One function of S-3 was to provide technical assistance to other agencies in the development of media, materials, and educational technology training packages. Priority was given to providing assistance to those involved in the development of training packages which focused on the severely and profoundly handicapped and the multiply handicapped. Priority was also given to providing assistance to those involved in the development of training packages for regular class teachers in the use, selection, and adaptation of instructional media and materials for the mildly and moderately handicapped students being mainstreamed.

S-3 worked with the Wisconsin Consortium for the Preparation of Regular Educators for Participation in the Education of Handicapped Children Series in planning and developing materials to train regular educators to work with children with exceptional educational needs.

Workscope Element IVA: Identify systems entries, classify and recommend usage of instructional materials for handicapped children.

Summary Strategy IVA-01: Identify abstracting candidates among "IIC" usables.

This strategy involved identification of preliminary NIMIS input candidates located as potentially useful and acquiring identified materials for in-house review and evaluation. The process developed by S-3 included reviewing catalogs for appropriate accession materials and marking them to be ordered. The following criteria were used as guidelines for determining the appropriateness of a material:

1. Is the material instructional?
2. Is the material different from other materials now available which have already been analyzed and entered into NIMIS?
3. Does the material appear to be out of date?
4. Does the material have field test data indicating that it is suitable for the handicapped populations served by S-3?
5. Is the material currently being used by teachers in educational programs for the handicapped populations served by S-3?
6. Has the material been recommended by an authoritative body for use with the handicapped populations served by S-3?
7. Has the material been designed by a publisher for the handicapping conditions served by S-3?

Catalogs marked for accessions were then edited to determine if S-1, S-2, or S-3 had already analyzed the recommended materials. The following sources were checked:

1. S-3 computer printouts, which list completed materials, by publisher; and
2. S-1 and S-2 lists.

Once catalogs were screened, an accession letter was typed specifying which materials S-3 wished to preview. Materials were later selected and accessed based on information derived from MAP recommendations (Figure 7).

When the material arrived, it was logged in and screened again to determine if it was complete and to ensure that it had not been reviewed previously. If the entire set of material was not received and additional components were necessary to complete the analysis, a check was made to determine if the rest of the material had been accessed but had not arrived. If the necessary components had not been accessed, the material was held until they could be acquired. If the material met all specifications, it then entered the evaluation phase of the process.

Summary Strategy IVA-02: Establish standards and criteria for materials production/evaluation.

This strategy involved four tasks: the development of standards and criteria for the selection of useful instructional materials, the adaptation of instructional materials, the development of instructional materials, and the assessment process for NIMIS entry. Although statistics indicate that there are well over 500,000 instructional materials which have been produced and which are currently available to schools for educational use, only a limited number of these materials have been found to be appropriate and effective when used with the handicapped population served by S-3. Since only a limited number of the available materials are ultimately found to be useful, appropriate, and effective when used with the S-3 handicapped population, careful review procedures were needed to screen the useful from the non-useful, the appropriate from the inappropriate, and the effective from the ineffective. These review procedures included sets of criteria and standards for making selection, recommendation, adaptation, and development decisions.

As part of this workscope, papers which included lists of appropriate materials, as well as information concerning selection criteria, were developed for several of the handicapping conditions. Documents completed include:

1. An Examination of the Problems Related to the Selection of Reading Materials Appropriate to the Needs of the Specific Learning Disabled
2. Teaching Reading to Children with Specific Learning Disabilities

3. Designing Quality Educational Programs for the Severely, Profoundly, and Multiply Handicapped
4. Designing Quality Educational Programs for the Mildly Handicapped
5. Minimum Guidelines Used in Consumer Information Analysis
6. Defining Quality Mathematics Instruction for Pupils with Specific Learning Disabilities
7. Teacher Use of Instructional Materials and Other Matters Related to Special Education IMC/LRC Collections
8. Standard Procedures for the Selection and Evaluation of Instructional Materials
9. Selecting Instructional Materials for the Mentally Retarded
10. Establishing Instructional Materials Criteria for the Mentally Retarded
11. Establishing Instructional Materials Criteria for the Emotionally Disturbed
12. Establishing Instructional Materials Criteria for the Specific Learning Disabled
13. Establishing Instructional Materials Criteria for the Multiply Handicapped
14. A Model for Adapting Instructional Materials (AIM) for Use in the Education of Children with Exceptional Educational Needs

Initial criteria included were:

1. Appropriateness, i.e., the need for the material and the usefulness of the material to a particular group of handicapped learners.
2. Usefulness of an instructional material, i.e., the correspondence between the media and material use requirements and the characteristic deficits and assets of the learners. If the learner can, through his or her profile of assets and deficits, accommodate to the use requirements of the material, then the material is judged usable by that learner. Usability, however, does not necessarily imply effectiveness.
3. Practicality, i.e., the cost effectiveness and general ease of use of the material. If a material does not meet the needs of the teacher, parent, or other professional charged with the responsibility of implementing the child's instructional program, then the other qualities of the material (e.g., appropriateness, effectiveness) will not be important because the material will not be used.
4. The quality of the instructional design, i.e., the technical quality of the product and the educational quality. Technical quality refers to production aspects; educational quality refers to specialization of the design relative to the needs of the learner.

Specific criteria and standards for the evaluation and selection of instructional media and materials for the handicapped population served by S-3 evolved during the past three years from criterion documents to useable summary checklists (Figures 13 & 14). The main strategies used to develop these guidelines for selection were:

1. to examine the procedures which have been used and developed by others involved in the evaluation and selection of instructional materials for the handicapped population served by S-3.
2. to review the media and materials technology literature to determine the technical quality of a material.
3. to review the research and development literature on handicapped learning, curriculum development, instructional media, and materials development for handicapped learners.
4. to draw upon the expertise of the staff of S-3 and professionals in the field who have had experience in the use, adaptation, design, development, and testing of instructional media and materials for the handicapped learner and in doing research on characteristics critical to the learning of the S-3 handicapped population.
5. to synthesize this information and from it formulate a series of checklists and questionnaires which can be used by reviewers to make judgments regarding the appropriateness, usefulness, and potential effectiveness of an instructional material for use with the handicapped population served by S-3.

Since the main reason for developing new materials or adapting existing materials is to provide materials which are more appropriate and effective in meeting the educational needs of these learners, these same criteria and standards were useful in determining those characteristics which any given material should have, whether it be a new material under development or an existing material to be adapted.

In the evaluation and selection of materials for NIMIS entry, the same standards and criteria are of importance. To facilitate application of the criteria and standards, checklists were prepared and updated as required for use in the NIMIS abstracting process. The abstractor Code 1 Checklist (Figure 13) is intended to cue abstractors to relevant data to be reported in the abstracts while assisting them in assigning and determining appropriate handicapping conditions.

Summary Strategy IVB-01: Evaluate material by standard criteria.

This task involved evaluating, by standard criteria, all material abstracted, adapted, and developed at S-3. The evaluation of instructional materials for NIMIS entry was initially completed in a two stage process. When supportive evidence was available on instructional

NIMIS MATERIAL SELECTION CHECKLIST 1

S-3 Material # ____________________

General Standards and Criteria for All Handicapping Conditions:

1. Is format appropriate according to at least one of the following? YES ☐ NO ☐
    a. Media characteristics
        1. Films / filmstrips / slides . . . . ☐
        2. Manipulative materials / games / puzzles . . . . ☐
        3. Photographs / drawings . . . . ☐
        4. Color . . . . ☐
    b. Pattern of presentation
        1. Limited number of items per task . . . . ☐
        2. Nondistracting . . . . ☐

IF YES, CONTINUE
IF NO. REJECT

2. Is the method or presentation appropriate according to at least one of the following? YES ☐ NO ☐
    a. Presentation
        1. Multi-sensory input . . . . ☐
        2. Alternate input and output modes . . . . ☐
        3. Simplicity and nondistracting character of auditory input . . . . ☐
        4. Short, direct verbal or written directions at appropriate developmental level . . . . ☐
        5. Short, predictable tasks . . . . ☐
        6. Clearly defined behavioral objectives for each program component . . . . ☐
    b. Response
        1. Physical involvement . . . . ☐
        2. Role playing . . . . ☐
        3. Adaptable groupings . . . . ☐
        4. Adaptable learning rates . . . . ☐
        5. High percentage of student involvement . . . . . ☐

IF YES, CONTINUE
IF NO, REJECT

3. Is the content appropriate according to at least one of the following? YES ☐ NO ☐
    a. Structural components
        1. Inherent positive reinforcement . . . . ☐
        2. Developmental progression of skills . . . . ☐
        3. Alternative format for relearning content . . . . ☐
    b. Instructional components
        1. Self concept / interpersonal relations skills . . ☐
        2. Subject matter approach . . . . ☐
        3. Experiential approach . . . . ☐

IF YES, CONTINUE
IF NO, REJECT

Figure 13. NIMIS Material Selection Checklist 1

CODE 1: STANDARDS AND CRITERIA FOR NIMIS ENTRY

S-3 Material # ____________________________

Handicapped conditions summary: ED___ LD___ EMH___ TMH___ SMH___ PMH___
SpH___ PH___ MH___

General Criteria for Learning Disabled, Emotionally Disturbed, Speech Handicapped:

1. Is format appropriate according to at least two general format criteria? . . . . YES ☐ NO ☐

IF YES, CONTINUE
IF NO, GO TO THE SECTION FOR THE MENTALLY HANDICAPPED

2. Is the method of presentation appropriate according to at least two of the general method criteria? . . . . . . YES ☐ NO ☐

IF YES, CONTINUE
IF NO, GO TO THE SECTION FOR THE MENTALLY HANDICAPPED

3. Is the content appropriate according to at least two of the general content criteria and at least one from "a" and one from "b"? . . . . YES ☐ NO ☐
   a. Does it ask the student to:
      1. Think through alternative solutions . . . . ☐
      2. Make decisions regarding the appropriateness of various solutions . . . . ☐
      3. Identify personal needs and abilities . . . . . ☐

   OR b. Is the purpose of the material to develop:
      1. Awareness and recognition of stimuli . . . . . . ☐
      2. Identification of stimuli . . . . ☐
      3. Discrimination of stimuli . . . . ☐
      4. Memory of stimuli . . . . ☐
      5. Association, classification or integration of stimuli . . . . ☐
      6. Comprehension of stimuli . . . . ☐
      7. Reproduction of stimuli . . . . ☐
      8. Use of feedback . . . . ☐
      9. Self concept or skills in dealing with others. . ☐

IF YES, CONTINUE TO SPECIFIC CRITERIA FOR ED, LD, SpH
IF NO, GO TO THE SECTION FOR THE MENTALLY HANDICAPPED

☐ Specific Criteria for Learning Disabled

Does the material:
   a. Deal with sensory training
      1. Auditory . . . . ☐
      2. Visual . . . . ☐
      3. Motor . . . . ☐

   OR b. Deal with skill acquisition in subject areas through adaptability to alternative input / output modes? . . . . YES ☐ NO ☐

IF YES, CODE LD
CONTINUE

Figure 14. Code 1: Standards and Criteria for NIMIS Entry

☐ Specific Criteria for Emotionally Disturbed

Does the material:

a. Meet at least three (3) general criteria for each section (format, method, and content)? YES ☐ NO ☐

AND b. Ask the student to:
  1. Define a situation from someone else's point of view . . . . ☐
  2. Interpret someone else's reaction . . . . ☐
  3. Clarify or define personal reactions / values ☐
  4. Request / receive positive feedback from teacher / peers . . . . ☐

OR c. Maintain low anxiety level through:
  1. Material structured with appropriate advanced organizers . . . . ☐
  2. Self-initiating correction techniques . . . . ☐

IF YES, CODE ED
CONTINUE

☐ Specific Criteria for Speech Handicapped

Does the material:

a. Develop
  1. Voice quality . . . . ☐
  2. Fluency . . . . ☐
  3. Articulation . . . . ☐

OR b. Have as its primary purpose, the teaching of
  1. Correct formation of sounds through a phonetic approach . . . . ☐
  2. Concept building and vocabulary through a developmental approach . . . . ☐
  3. Syntax through a grammatical approach . . . . ☐

OR c. Allow use of alternative speech structures . . . . ☐

IF YES, CODE SH
CONTINUE

General Criteria for Mentally Handicapped

1. Is the format appropriate according to at least two (2) of the general format criteria? YES ☐ NO ☐

IF YES, CONTINUE
IF NO, GO TO THE SECTION FOR PHYSICALLY HANDICAPPED

2. Is the method of presentation appropriate according to at least two of the following:
  a. Concepts presented in recurring developmental sequence . . . . ☐
  b. Continued through varied activities . . . . ☐
  c. Minimal verbal skills . . . . ☐
  d. Adaptable to multi-sensory input . . . . ☐
  e. Short verbal directions . . . . ☐
  f. Adaptable for individual learning rates . . . . ☐
  g. High degree of active student involvement . . . . . . ☐

IF YES, CONTINUE
IF NO, GO TO THE SECTION FOR PHYSICALLY HANDICAPPED

Figure 14. Code 1: Standards and Criteria for NIMIS Entry (Cont.)

3. Is the content appropriate according to at least one of the following?
    - a. Teaches skills and content of a concrete nature . . . . [ ]
    - b. Teaches self-help skills . . . . [ ]

IF YES, CONTINUE
IF NO, GO TO THE SECTION FOR THE PHYSICALLY HANDICAPPED

[ ] Specific Criteria for Educable Mentally Handicapped

Does the material:
- a. Teach students who have an absence or limited use of verbal language . . . . [ ]
- b. Teach students with limited proficiency in motor development . . . . [ ]
- c. Relate to basic academic skills (reading, math, science, social studies), vocational skills, or skills in affective development . . . . [ ]
- d. Deal with skills in health, safety, and money management . . . . [ ]

IF YES, CODE EMH
CONTINUE

[ ] Specific Criteria for Trainable Mentally Handicapped

Does the material:
- a. Deal with communication skills, social skills, or skills in motor development . . . . [ ]
- b. Cover basic academic skills (elementary reading, writing, elementary science, elementary math, music) or vocational skills . . . . [ ]
- c. Provide opportunities for enrichment through a variety of cultural experiences on a sensorial level . . . . [ ]

IF YES, CODE TMH
CONTINUE

[ ] Specific Criteria for Severely Mentally Handicapped

Does the material:
- a. Teach students basic daily living and self-care skills such as toileting, dressing, walking, and feeding . . . . [ ]
- b. Teach simple chores . . . . [ ]
- c. Teach pupils basic language and vocabulary skills [ ]

IF YES, CODE SMH
CONTINUE

[ ] Specific Criteria for Profoundly Mentally Handicapped

Does the material:
- a. Teach basic ambulatory skills . . . . [ ]
- b. Deal with feeding and/or toileting skills . . . . [ ]

IF YES, CODE PMH
CONTINUE

Figure 14. Code 1: Standards and Criteria for NIMIS Entry (Cont.)

☐ Criteria for Physically Handicapped

1. Is the format appropriate according to at least one of the following?
   a. Allows room for imprecise motor control . . . . . ☐
   b. Limited number of items per task . . . . ☐

IF YES, CONTINUE
IF NO, GO TO THE SECTION FOR THE DEAF BLIND

2. Is the method of presentation appropriate according to at least one of the following?
   a. Accomodates for specific language disabilities in the areas of stuttering and articulation . . . ☐
   b. Involves mainly gross responses or simple fine motor manipulative responses such as touch response . . . . ☐

IF YES, CONTINUE
IF NO, GO TO THE SECTION FOR THE DEAF BLIND

3. Is the content appropriate according to at least one of the following?
   a. Provides for development of motor skills . . . . ☐
   b. Develops self-concept and skills in interpersonal relationships . . . . ☐

IF YES, CODE PH
CONTINUE

☐ Criteria for Deaf-Blind

1. Is format appropriate according to at least one of the following?
   a. Utilizes braille system or nemeth code . . . . . ☐
   b. Utilizes large print / illustration size . . . . ☐
   c. Utilizes simple visual figure-ground characteristics . . . . ☐

IF YES, CONTINUE
IF NO, GO TO THE SECTION FOR MULTIPLY HANDICAPPED

2. Is the method of presentation appropriate according to at least one of the following?
   a. Incorporates adjustable volume control . . . . . ☐
   b. Involves mainly gross motor responses or simple fine motor manipulative responses such as a touch response . . . . ☐
   c. Multi-sensory input . . . . ☐

IF YES, CONTINUE
IF NO, GO TO THE SECTION FOR MULTIPLY HANDICAPPED

3. Is the content appropriate according to at least two of the content criteria on page 1 [of this form]? . . YES ☐ NO ☐

IF YES, CODE DEAF BLIND
CONTINUE

Figure 14. Code 1: Standards and Criteria for NIMIS Entry (Cont.)

☐ Criteria for Multiply Handicapped

If two of the following areas are checked, a MH assignment may be made:

1. Educable mentally handicapped; trainable mentally handicapped; severely mentally handicapped; profoundly mentally handicapped . . . . ☐
AND 2. Speech handicapped . . . . ☐
OR 3. Physically handicapped . . . . ☐
OR 4. Deaf-blind . . . . ☐
IF YES,CODE MH

Figure 14. Code 1: Standards and Criteria for NIMIS Entry (Cont.)

material which verified the material's need, usefulness, appropriateness, or effectiveness, the material was added to the selection verification lists and the supportive documentation was tabulated on the selection verification form (Appendix K). When no supportive evidence was available on an instructional material to verify its need, usefulness, appropriateness, or effectiveness, the material was evaluated through staff appraisal.

S-3 criteria for selections of items for entry into NIMIS during the first project year were:

1. Materials which were appropriate for the mentally handicapped, severely emotionally disturbed, learning disabled, multiply handicapped, speech handicapped, and physically handicapped.
2. Materials which publishers indicated were designed for the handicapped populations served by S-3.
3. Materials which had field evaluation data showing them to be suitable for the handicapped populations served by S-3.
4. Materials that were used by teachers in educational programs for the mentally handicapped, severely emotionally disturbed, learning disabled, multiply handicapped, speech handicapped, and physically handicapped. Examples of data collected with regard to materials currently in use:
    a. St. Francis Children's Activity and Achievement Center--Milwaukee, Wisconsin
    b. Central Wisconsin Colony--Madison, Wisconsin
    c. Rutland Center--Athens, Georgia
    d. St. Coletta Training School--Milwaukee, Wisconsin
    e. Madison Public Schools: Special Classes--Madison, Wisconsin
    f. MAZE Project (Madison Alternative for Zero Exclusion)--Madison, Wisconsin
    g. Programs for Handicapped: Educational Facilities Center--Chicago, Illinois

5. Materials that appeared in listings compiled by other information systems that have served teachers of the handicapped. Examples of listings:
    a. MARS (Material Analysis Retrieval System)
    b. Computer Based Project
    c. PA/RRC
    d. Auditory Learning Consortium
    e. Texas I.M.C.
    f. Kentucky I.M.C.
    g. California I.M.C. Bibliographies
6. Materials that were recommended by an authoritative body for use with the mentally handicapped, severely emotionally disturbed, learning disabled, multiply handicapped, speech handicapped, and physically handicapped. Examples of data collected from authoritative bodies:
    a. IMC/RMC Network Survey
    b. Albany ASEIMC Most Loaned Items (1969, 1971)
    c. Buffalo ASEIMC Most Loaned Items (1969, 1971)
    d. Cuny ASEIMC Most Loaned Items (1969, 1971)
    e. Kansas SEIMC Frequency of Materials Loaned Study
    f. Northwest ASEIMC Study (Latham, 1975)
    g. Florida Resource Center Alpha Recommendations
7. Materials that were recommended for the handicapped populations served by S-3 in current research and publications.
8. Materials that were reviewed by S-3 staff and judged appropriate for use with the S-3 Relevant Learner Descriptions.

To assist analysts in appraising both the quality of the material and its appropriateness for the handicapped population served by S-3, a standard checklist for the evaluation of materials was prepared in February 1976 (Figures 13 and 14). This checklist was completed for each material. The evaluation documentation compiled on each material was tabulated and stored in the materials folder for that material. The evaluation information was reported on the NIMIS record form by checking and completing one or more of the following four statements:

1. This material has been reviewed by S-3 and judged appropriate for use with the ______________________.
2. Field evaluation data are available. Results show that these materials are suitable for ____________.
3. Evidence shows that this material is currently being used by teachers in educational programs for the ____.
4. This material has been recommended by an authoritative body for use with the ________________________.

Materials deemed inappropriate for use with the S-3 handicapped population were so coded in the permanent records. There was some feeling among S-3 staff that those materials deemed inappropriate should also be entered into NIMIS with minimum description and no recommendation. This procedure would forestall an individual from considering unapproved materials because he or she did not understand why it was not in the data base (Figure 15).

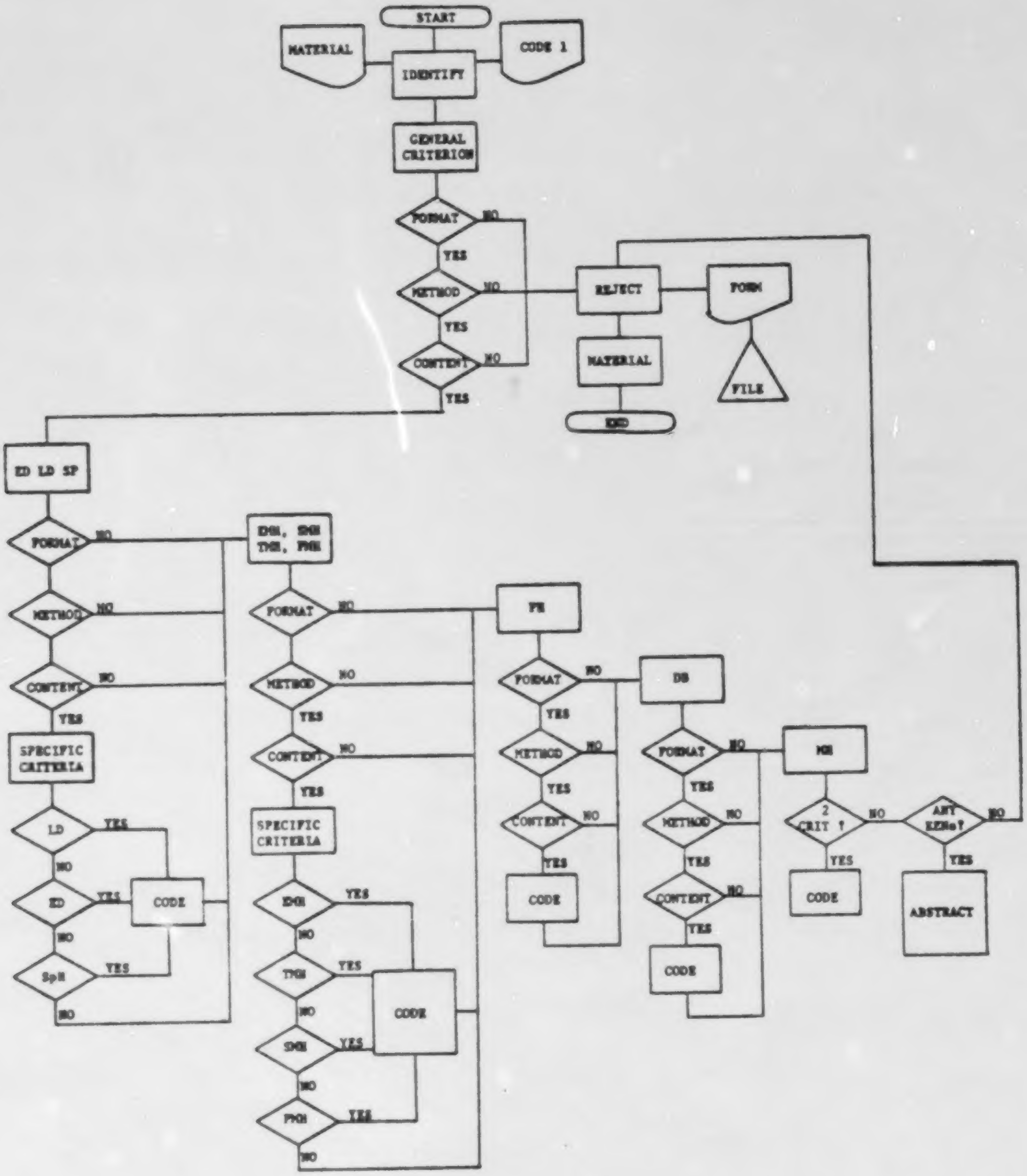
Summary Strategy IVC-01-1: Describe materials and encode descriptions for data base entry.

The activities of this workscope were intended to involve the preparation of abstracts for NIMIS entry and the collection of feedback on the NIMIS system. Included in the first strategy were four tasks. The first, develop and update the Thesaurus, was carried out through Thesaurus Committee meetings and S-3 in-house meetings for Thesaurus recommendations.

The role of Thesaurus descriptors in the National Instructional Materials Information System (NIMIS) was defined by the National Center on Educational Media and Materials for the Handicapped (NCEMMH) in spring 1975. The descriptors were to provide an outline of the content of the abstract, covering every aspect of the abstract. S-3, in preparing abstracts, recognized that a much wider language base was needed in the Thesaurus. A similar conclusion was reached by the NIMIS Thesaurus Committee during their meeting in New Orleans on February 19, 1975. A recommendation was made at this meeting that S-3 and the other Specialized Offices be encouraged to contribute to as wide a base as they deemed advisable and necessary for a major revision of the Thesaurus to be completed by April 15, 1975. S-3 contributed to this task by developing a hierarchical listing of the terms presently in the Thesaurus in the form of a computer printout. The rationale behind this approach was to outline the terms in a logical sequence to easily ascertain where there were gaps in the structure which needed to be filled in by the addition of new items. This logical sequencing of the Thesaurus was also intended to expedite the retrieval process by S-3.

This categorical breakdown was presented to the Thesaurus Committee in Columbus, Ohio, on October 29-30, 1975. At that time S-3 was asked to prepare and forward documentation and rationale for the hierarchical listings of the Thesaurus. This task was to be completed by December 1, 1975, and on completion it was to be sent to all of the members of the Thesaurus Committee. The categorical breakdown was eventually reduced from a computer printout to a checklist of descriptors (Appendix L). This checklist contained all of the approved terms in the Thesaurus as well as terms which were thought to be useful for reference in locating appropriate Thesaurus terms. A categorical checklist was to be completed for each material and placed in the material's abstract folder along with a copy of the official NIMIS report sent to Ohio. This checklist format was used to provide evidence of the need for new Thesaurus terms.

Although the initial categorical listing and the typed revision proved useful in suggesting a structure for the Thesaurus and in developing new terms for the data base, the checklist did not prove to be


START
MATERIAL
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ABSTRACT

Figure 15. Material Evaluation/Coding Process

efficient for several reasons. It was time-consuming to complete it and then transfer the data to the NIMIS form. The analysts often neglected to use only the approved Thesaurus descriptors and thus submitted many NIMIS forms with unapproved reference terms which were subsequently rejected. The Thesaurus Committee did, however, adapt a categorical listing and NIMIS disseminated this document to all of the Specialized Offices.

At the Thesaurus Committee Meeting in Columbus, Ohio, on May 15-16, 1975, Carl F. Oldsen stated that NCEMMH Information Services would accept applications for additional changes or modifications at any time provided they were submitted on a Descriptor Justification/ Modification Form. To comply with this directive, specific submission procedures were developed at S-3. If a new term was to be proposed in the Thesaurus descriptor field, it was up to the analyst submitting the term to:

1. obtain approval for the term and its definition from his or her coordinator.
2. prepare in triplicate the official NIMIS form for submission of new terms.
3. place the official form in the folder, with the term in parentheses, before the folder went to the cross-checker.

Cross-checkers were instructed to make sure that every folder with a new term had such a form.

The number of Thesaurus descriptors applied to a material was a controversial issue in 1975-1976. The National Center desired to limit the number of descriptors to 18 for ease of retrieval and to limit cost factors involved in retrieval. S-3 urged the Thesaurus Committee to support a maximum of 30 descriptors when indexing series overviews and high quality kits and programs.

S-3 also urged continued use of descriptors to indicate the input/ output mode required of a learner to use a particular material, because this information is useful to professionals dealing with the learning disabled; the multiply, severely, and physically handicapped; and the speech impaired. S-3 recommends that efforts be continued to make the Thesaurus a hierarchical scope and sequence within each subject area.

Summary Strategy IVC-01-2: Train and monitor in-house abstractors.

The second task, train and monitor in-house abstractors, included the preparation of individuals to abstract and the periodic review of their work. Several training sessions were held to ensure a standardized procedure for abstract preparation. In-house training procedures were refined over time to ensure that each abstractor understood and had competencies to:

1. provide a standardized description of instructional materials; and
2. complete the abstract with ongoing knowledge of information required in all fields and with informational accuracy.

The training process involved having new abstractors prepare short abstracts which were then reviewed and critiqued by experienced staff members.

Summary Strategy IVC-01-3: Conduct initial abstracting for NIMIS entry.

Abstracting at S-3 involved describing the content, teaching method, and physical format of an instructional material, thus providing information to assist users in deciding whether to borrow or purchase that item for instructional use.

Given the standardized and descriptive nature of the NIMIS abstract, the initial abstracting process for NIMIS entry focused upon presenting information determined appropriate through the evaluation process described above. The abstracting process involved examining the material to:

1. verify the title according to the material catalog;
2. check the copyright;
3. check to verify that all components of materials are accurately represented; and
4. check for incomplete series.

Abstractors then filled out the NIMIS form on each material which required the following infomation:

1. S-3 code number
2. Author information
3. Price
4. Publisher address (2 lines)
5. Copyright date
6. Vendor
7. Selection verification coding
8. Abstract information
    a. Instructional purpose
    b. Physical description/content
    c. Instructional level
    d. Required learner response, where appropriate
    e. Publisher's specifications for handicapping conditions, where appropriate
    f. Media format variant, where appropriate
9. Thesaurus descriptor
10. Name of second author, where appropriate
11. AV information as per manual, where appropriate

The completed NIMIS entry, in rough draft form, was submitted for typing and the material returned to the publisher. Typed abstracts were submitted to NCEMMH for editing and entering into NIMIS.

Of 3,000 items of materials reviewed for data entry during the first year, 291 were submitted. These 291 were rejected, however, on the basis of non-adherence to the first draft guidelines of the NIMIS Procedures Manual. They were resubmitted in the second year and accepted for entrance. 7,228 items were submitted during the second year and 6,802 items were submitted during the third year (Table 5).

During the first two years of the project all abstracts were cross-checked for validity by two editors at S-3 prior to being sent to NCEMMH. The cross-check process was discontinued in September 1976, and each abstractor was made personally responsible for the quality of his or her own work. Upon receipt, editors at NCEMMH screened the abstracts for completeness and adherence to data entry specifications. Phone conversations for clarification of information between S-3 and NCEMMH were conducted. If clarification and agreement could not be reached via the telephone, abstracts were returned to S-3 and one of three processes was undertaken:

1. The abstract was cross-checked, information revised, retyped, and sent back to NCEMMH.
2. The abstract was cross-checked and revised. There was telephone communication with publishing source for clarification, typed, and the abstract was sent back to NCEMMH.
3. The abstract was cross-checked and information which involved reaccessioning of material found missing. Material was then reaccessed, cross-checked, revised, typed, and sent to NCEMMH.

A more cost efficient and cost effective system of initial abstracting would have permitted data to be entered directly into the data base by S-3 staff. Editing could then have been continued via the terminal printouts, saving expenses of typing, duplicating, and mailing.

Summary Strategy IVC-02: Collect feedback on NIMIS system and attend NIMIS training sessions.

The second workscope strategy of collecting feedback on NIMIS and attending NIMIS training sessions involved three tasks:

1. Assessing abstract formats.
2. Assessing handicapping conditions subcategory needs.
3. Participating in NIMIS training sessions.

Table 5

ACCOUNTABILITY DATA

(Number of Initial Abstracts Completed for NIMIS Entry by S-3 [1974-1977])

	# Abstractors	# NIMIS Completed	Average # of NIMIS Completed per full-time Abstractors
YEAR 1			
Quarter 1	0	0	NA
Quarter 2	0	0	NA
Quarter 3	0	0	NA
Quarter 4	20	291	NA
YEAR 2			
Quarter 1	13.4	1252	93
Quarter 2	11.6	2235	192
Quarter 3	11.2	2157	192
Quarter 4	9.7	1584	163
YEAR 3			
Quarter 1	7.6	1794	236
Quarter 2	8.6	1898	221
Quarter 3	6.0	1919	320
Quarter 4	4.5	1191	265

Summary Strategy IVC-02-1: Assess abstract format.

NCEMMH staff met with the S-3 staff in November 1976, to discuss abstract format, length of entries, and number of descriptors. The goal of the meeting was to acquire greater uniformity in abstracts.

Summary Strategy IVC-02-2: Assess handicapping condition subcategory needs.

The inclusion of handicapping condition descriptors with the rest of the Thesaurus descriptors had varied throughout the life of the S-3 project. During two time periods (June to October 1975 and August to October 1976), handicapping condition descriptors were not listed at all on the majority of NIMIS entries. In the first few months of NIMIS preparation between June and October 1975, the handicapping condition descriptors were only listed for those materials that were specifically designed for handicapped students, as stated by the publisher, or that had field test data to support their suitability for use with handicapped students. On October 13, 1975, the use of handicapping condition descriptors was expanded to include descriptors when there was selection verification data which indicated use with a particular population of the handicapped.

The procedures which were eventually adopted by the Thesaurus Committee, and are used in a modified form to date, were presented to the NIMIS Committee at a meeting in Denver, Colorado, on October 20-21, 1975, by the coordinator of S-3 and were later incorporated in a position paper authored jointly by the Specialized Office coordinators.

On October 28, 1975, the inclusion of handicapping condition descriptors was expanded considerably when new evaluation coding procedures were developed. These procedures included the use of an "Evaluation Checklist for Code 1" which enabled the analysts to evaluate materials along standard criteria. The following evaluation statement appeared on every NIMIS material from that time: "This material was reviewed by Specialized Office 3 and judged appropriate for use with the ___________." The corresponding handicapping condition descriptors were then listed in the Thesaurus descriptor field. In practice this meant that every material would be assigned at least one handicapping condition descriptor, since any material that was judged inappropriate for any handicapping condition by S-3 was automatically rejected and never entered into the system. This evaluation checklist was revised in February 1976, to reflect greater specificity in determining appropriate handicapping condition codes.

On June 8, 1976, Carl F. Oldsen updated the relevant guidelines, stating:

1. "The materials must actually be useful to the handicapping condition. To indicate appropriateness when there is no conclusive supporting evidence only obfuscates those materials that truly were designed to be used by a particular handicap.

2. When the material is actually specified for use with an exceptional child as designated by the publisher, apply all handicapping descriptors that are appropriate, not merely those relevant to your particular handicapping area. When applying handicapping condition descriptors, do not limit the scope to your own area of expertise: rather choose all appropriate descriptors from all the exceptionalities category as is pertinent."

The analyst staff at S-3 felt the handicapping condition descriptors were important and were concerned with the need to make the NIMIS entries of the past year consistent with future entries. It was felt that it would be misleading for the user of the system to find that S-3 had recommended the use of all materials for some handicapping conditions between October 1975 and June 1976, and none for any entries made after that. The options presented were to continue to code handicapping condition recommendations or to eliminate the Code 1 recommendation on all past abstracts. At a meeting with Carl Oldsen on October 7-8, 1976, it was decided that S-3 should continue determining the appropriateness of materials for handicapped students and assigning handicapping condition descriptors to those materials.

In the spring of 1977 new guidelines were developed at NCEMMH for recording field test data and publisher-specified information regarding handicapping condition descriptors in the Thesaurus. The guidelines involved the use of three letter abbreviations for each handicapping condition descriptor followed by a "P" in those cases where a publisher had specified the materials for use with handicapping conditions and an "F" indicated that the material was suitable for certain handicapping conditions. Assignments of handicapping condition descriptors not followed by abbreviations indicated an in-house judgment at S-3.

S-3 recommends that a new system of assigning handicapping condition descriptors be considered. By classifying materials as appropriate for Early Childhood Handicapped, Mildly Handicapped School Age, Severely and Profoundly Handicapped School Age, and Vocational and Adult Programs, difficulties in determining discrete differences between handicapping conditions could be avoided.

Summary Strategy IVC-02-3: Participate in NIMIS training sessions.

There were two NIMIS training sessions to teach staff to use the terminals and appropriate search strategies and techniques. The first session, held at NCEMMH on November 15-17, 1976, focused on indexing from the retrieval point of view. The second session, held on February 9-10, 1977, was a training session in using the Hazeltine 2000 computer to retrieve data.

Workscope Element VT: Advise and critique S-4 in services to S-4 clients.

Summary Strategy VT-01-1: Advise and make recommendations to S-4 on purchases and balance of holdings.

The Specialized Office for Materials Distribution (S-4) was proposed to serve as a national depository for the Learning Resource Center (LRC) Program's collection of materials. The goal of the LRC Program was to provide for the media and materials needs of the handicapped population on a national scale by providing for various media and material to be available on loan from S-4. The information from S-4 would provide the user data regarding where and when an instructional material would be available. S-3 was given the responsibility of recommending purchases to S-4. S-3 provided S-4 with the following recommendations for materials accessions during FY 1975 in three major categories:

1. High priority: recommend accession.
2. Middle priority: recommend accession if sufficient funds.
3. Materials provided free to S-3: forwarded upon completion of the NIMIS record form. Recommendations in this last category were made regarding the 3,000 materials selected for abstracting during the fourth quarter of FY 1975.

During FY 1977 recommendations were provided to S-4 upon request. Additional activities between S-3 and S-4 for FY 1977 included the following:

1. S-4 requested that S-3 screen a list of 1974-1975 S-3 recommendations via their preparation numbers and indicate which were rejected and which were entered into NIMIS. Of the 57 preparation numbers, S-3 reported that 24 were entered, 22 were rejected, and 11 were not done.
2. S-4, S-3, CORRC (Coordinating Office for Regional Resource Centers), and the RRCs (Regional Resource Centers) participated in a field test of Recommended Procedures for the Entry and Retrieval of Appraisal and Prescriptive Programming Information in the National Instructional Materials Information System (NIMIS). The field test was conducted during the period from February 1, 1977 to July 31, 1977. During the field test phase only the input process was tested and CORRC/RRCs did not attempt any retrieval activities. The procedures for the field test included the following steps of particular importance to S-3 and S-4.
    a. CORRC and participating RRCs sent two copies of selected materials with the information forms to S-4.

b. S-4 received the CORRC/RRC products and accessed the materials. One copy of each product and an information form for each product was sent to S-3.

c. S-3 received the CORRC/RRC products from S-4 and abstracted the products using the NIMIS Report Form. After the products were abstracted, they were returned to S-4 for storage. The NIMIS Report Form was forwarded to NCEMMH. Of the 50 items suggested RRC developed products, 47 were submitted for entry into NIMIS for this field test effort.

3. S-4 and Media, Materials, and Technology (MMT) of NCEMMH agreed that certain products developed by MMT should be abstracted by S-3 in the spring of FY 1977. S-3 abstracted these products and returned them to S-4 for catalog preparation and availability to users. The abstracts were forwarded to NCEMMH for entry into NIMIS.

III. CONCLUSIONS AND RECOMMENDATIONS

A. Summary and Accomplishments

The major operational objectives for S-3 included locating and evaluating existing instructional materials suitable for use with all handicapping conditions other than the deaf and blind; adapting and developing instructional materials which were unavailable and "unattractive" to commercial developers; and evaluating the adapted and developed materials with appropriate target populations. The primary function of S-3 was to locate and evaluate suitable instructional materials for all "other" handicapping conditions for entry into the National Instructional Materials Information System (NIMIS).

Within these objectives the major project successes accomplished by S-3 included assisting BEH in assuring that each child with exceptional educational needs receive an appropriately designed education by locating, abstracting, and entering into the NIMIS data base 14,321 instructional materials. To facilitate the NIMIS entry of these materials S-3 developed a standardized system for locating and accessing published instructional media and materials (Figure 4), and created the Materials Accession Process (MAP) for using teacher input to locate materials and media used by specific handicapped populations (Figures 5 and 6).

A second major accomplishment of S-3 was the development of the Adapting Instructional Materials (AIM) model which provided a systematic procedure for identifying products to be adapted (or developed); assessing the population to determine needed modifications; specifying product objectives; selecting instructional strategies, activities, and media and material characteristics; developing the material; and evaluating the new material through pilot and field test procedures (Figures 8 through 12).

A final major accomplishment of S-3 was the successful field testing of the entry and retrieval of appraisal and prescriptive information in the National Instructional Materials Information System (NIMIS). Of the 50 items suggested RRC developed products, 47 were submitted for entry into NIMIS for this field test effort.

B. Recommendations for Future Workscope Activities

For future efforts in assisting teachers in the selection and use of instructional materials and media for individuals with exceptional educational needs, S-3 strongly recommends planning and integrating of theoretical models with practical work activities. The enhancement of project functioning through the predetermination of goals and objectives and the means whereby they will be reached is of critical importance. Specific recommendations include the following.

Through the aforementioned MAP it has been suggested that professional organizations can meet some of the needs of their populations and serve as catalysts for the development of new materials and methods for integrating the assessed needs of teachers and RRC staff into the Materials Accession Process. Expanding MAP to involve the experiences and expertise of professionals working with all types of handicapped individuals would provide a process for inservicing professional staff as well as for locating appropriate materials.

S-3 further recommends that the NIMIS Thesaurus be revised into a hierarchical scope and sequence presented in a parallel manner for each subject area. A new system of assigning handicapping condition descriptors, classifying materials as appropriate for Early Childhood Handicapped, Mildly Handicapped School Age, Severely and Profoundly Handicapped School Age, and Vocational and Adult Programs, in concert with a revised set of Thesaurus descriptors would yield more thorough and informative abstracts which could specify entry level behavior, learning contingencies, and criterion measures.

Materials deemed inappropriate for use with individuals with exceptional educational needs should also be entered into NIMIS with minimal description and without recommendation. This would permit NIMIS users to recognize that the material in question had been reviewed and not just overlooked.

A more cost efficient and cost effective system of initial abstracting would have permitted data to be entered directly into the computer by S-3 staff. Standardized abstract formats could be used and editing could be continued via the terminal printouts, saving expenses of typing, duplicating, and mailing.

S-3 also recommends continued use of a systematic adaptation and development process such as AIM. The revision of media and material format, content, and methodology to reflect the individual learner and teacher characteristics would facilitate the appropriate programming for children with exceptional educational needs by making better products available for their use.

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FINAL TECHNICAL REPORT
APPENDICES

Specialized Office Three

The Wisconsin Research and Development
Center for Cognitive Learning
University of Wisconsin
Madison, Wisconsin 53706

September 1, 1974 through July 31, 1977

Contract Number
#300-75-0044

November 15, 1977

Learning Resources Branch
Division of Educational Media Services
Bureau of Education for the Handicapped
U.S. Office of Education
U.S. Department of Health, Education, and Welfare

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY
Regents of the
Univ. of Wisconsin
TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC) AND
USERS OF THE ERIC SYSTEM."

EC104191

Contract Number
#300-75-0044

Final Technical Report of Specialized Office Three

APPENDICES

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University of Wisconsin

Madison, Wisconsin
November 15, 1977

This project reported herein are performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

U.S. DEPARTMENT OF
HEALTH, EDUCATION AND WELFARE
Office of Education
Bureau of Education for the Handicapped

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PREFACE

Specialized Office Three (S-3), located at the University of Wisconsin, Madison, Wisconsin, was funded by the U.S. Office of Education, Bureau of Education for the Handicapped. This report describes the activities of S-3 from its funding in September 1974, through July 1977, when the present contract ended.

The mission of S-3 was to improve the opportunity for handicapped children to receive the best possible education with the use of educational technology through S-3's involvement in the following major workscopes:

1. To locate, adapt, develop, describe, and recommend instructional materials for use with other handicapping conditions, namely: mentally retarded, emotionally disturbed, specific learning disabled, speech impaired, orthopedically handicapped and other health impaired multiply handicapped.
2. To provide specialized consultive support and technical assistance in the areas of the handicapping conditions specialities and production support in media, materials and education technology training material development.
3. To identify those materials which should be included in the National Instructional Materials Information System and describe and encode these materials for data base entry.

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APPENDIX A

Toilet Training: How to Teach Your Developmentally Delayed Child

TOILET TRAINING: HOW TO TEACH YOUR DEVELOPMENTALLY DELAYED CHILD

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FOREWORD

Experiencing a feeling of independence is truly exciting for any child. The purpose of this book is to help children with special needs feel good about themselves in a very important area--toileting. The book is also intended to help you--the parents--to establish this independence so that you can share in the child's pride and satisfaction.

The toilet training program described in this book was originally developed in 1971 as part of a research project at the Northwest Regional Special Education Instructional Materials Center and at the Center at Oregon for Research in the Behavioral Education of the Handicapped. The present revised edition was completed by Specialized Office Three at the University of Wisconsin in 1977 at the request of the National Center on Educational Media and Materials for the Handicapped in Columbus, Ohio.

This edition is designed for the developmentally delayed preschool child. Potential users may include trainable mentally handicapped, educable mentally handicapped, mildly physically impaired, or deaf-blind. This does not preclude its use, however, with an older child, a child with a more severe handicap, or even with a normal child.

Developmental field testing was done with preschool children with a chronological age range of 1.3 - 4.8 years and a mental age of 41 weeks to 2.8 years. The handicapping conditions of these children included minimal brain damage, cerebral palsy, down syndrome, and developmental delay.

Thanks are due to Project P.O.P.E. in New Jersey and to the Marquette Alger Intermediate School District in Michigan, for their cooperation in taking part in this field test as well as to the Early Childhood Project associated with the Madison (Wisconsin) Public Schools for allowing us to photograph some of their pupils.

Appreciation also goes to Mary Laurence Weber and Sally Bulford who edited this edition of the book, to Alan Pearlman who did the photographs and to Mary Pulliam who did the design work for the book.

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BEFORE YOU BEGIN

What is toilet training?

Toilet training is the process of teaching a child to use the toilet when he or she feels the need to wet or have a bowel movement.

When and where should this program be taught?

The program should be a part of your everyday living. You should schedule it with your regular activities--housework, errands, caring for other children, or a job. If someone else takes care of your child during part of the day, such as a school teacher or a sitter, you should explain the program to that person. Work closely with him or her so that your child is toilet trained in the same way all the time.

How does this program teach toileting?

Toilet training is broken into several steps. First the program concentrates on the physical and mental preparations a parent must make before beginning the training. Then it goes into the charting necessary to determine the child's toileting pattern. Next the program describes the actual toileting procedures: choosing a word or sign that the child can use, taking the child to the bathroom, keeping track of successes in using the toilet and finding solutions to any problem areas in getting the child to tell of a need to use the toilet.

GET READY

Toilet training requires both physical and mental preparations. First you must be sure that your child is ready to be trained. Once you know the child is ready, you must commit yourself to investing time, being consistent, and being positive. Next you must obtain a potty chair, adapted toilet seat or adapted toilet chair, training pants, and simple clothing. Finally you must be ready to apply whichever adaptive techniques your child needs. This book will help with each of these steps.

Ask yourself: Is my child ready?

Think about these questions:

Is the child continually wet throughout the day?

Does the child wet each time he or she laughs or cries?

Does the child wet soon after drinking a small amount of fluid--perhaps a half glass of milk or juice?

If you answered "yes" to any of those questions talk to your family doctor before beginning training. Tell the doctor about the program and ask his or her advice. If the doctor thinks that the child lacks the muscle control necessary for training, he or she may suggest exercises, medication, or postponing the program until the child has developed more control.

If you answered "no" to the questions, ask yourself the following:

Does the child go to a particular spot to wet?

Does the child tell you about wetting after the fact?

Does the child get a faraway, dreamy look just before wetting?

Does the child stop whatever he or she is doing for a short time before wetting?

Does the child wet and change himself or herself?

Do you find that the child stays dry all night?

If you answered "yes" to one or more of those questions you have good signs that the child is very aware of his or her need to wet and that the child may indeed be ready for toilet training.

Decide if you have the time

Before you begin to invest your time in this toileting program consider whether you have enough time and energy now to give to the task.

Do you have other children home from school with illnesses?

Are you expecting a visit from grandma shortly?

Are you going to be busy with things outside the home?

Is a holiday approaching?

Are you about to go on a vacation?

If any of those things are happening or are about to happen, this isn't a good time to begin training. Postpone the task awhile.

Set the rules of the game

The child must always know what you expect. As you go through each step of toilet training, keep your instructions simple. Tell the child what you want him or her to do and why. Use gestures if the child doesn't understand words. Each time you practice a skill with a child try to use the same gestures or the same instructions--word for word. Show the child what to do by doing it yourself so that he or she has a concrete example to imitate.

Be positive

In order to change your child's habits and to get him or her to use the toilet at the right time, you must believe that you are going to be successful. And you must believe it strongly enough so that the child picks up your positive feelings. Here are seven points to remember and practice all the time. It may be helpful to paper clip this page and read it over again and again during the program.

Be patient and understanding throughout the child's toilet training.

Remember that all children develop at different rates so your child may progress more slowly or more quickly than another.

Be calm, unhurried, and relaxed.

Expect and accept puddles and wet pants during training. If the child has an accident don't say anything to the child, don't frown, and don't punish or spank. Simply change the child without looking him or her in the eye and use as little physical contact as possible.

If the child is having successes--even small ones--be sure to tell the child how pleased you are. Tell grandma, grandpa, brothers, sisters, neighbors, and friends about the program and ask them to help by praising the child's successes.

Praise or reward only those actions you would like to see happen again.

Do not expect a perfect performance and complete success for some time. Praise your child even for partial success.

Reward the child

Rewarding a child is the most important point about being positive. When you choose a reward for the child, pick one you think the child will like and one you are comfortable with. For example, if you don't like the idea of food in the bathroom, don't pick food as a reward. If you don't feel good about a reward you may hold back from using it even without meaning to. If the child doesn't feel good about a reward, he or she isn't going to get excited about it and it won't encourage the child to do what you want. If you find that one reward you choose doesn't please your child, by all means try another. Here are some ideas for rewards:

- cookies, raisins, crackers, or child's favorite snack
- clapping
- nodding your head
- playing a game with the child
- smiling
- touching
- shaking hands
- letting the child help with housework
- holding hands
- singing songs
- reading to the child
- a squirt of hand lotion
- a drink of soda, milk, water or other favorite drink
- winking
- hugging
- patting the child's head, shoulder, or back
- stroking the child's arm
- listening to music
- letting the child take care of pets
- television
- rough-housing with the child
- a piggy-back ride
- verbal praise ("good boy" or "good girl")

Obtain potty adaptation

You want the child to be comfortable, so that he or she can concentrate on using the toilet without fear of falling in. A separate potty chair, an adapted toilet set that attaches to the toilet, or an adapted toilet chair can be used. If the child has a body brace, he or she may be able to use your regular toilet seat.

Potty chair

As soon as you obtain the potty adaptation place it in the bathroom to get the child you are training used to seeing it. Encourage the child to sit on this potty adaptation several times during the day so that the child will feel comfortable using it later on.

Obtain training pants

It is important to obtain training pants that fit the child properly. Twelve to 14 pairs should always leave you with a dry pair in case of an accident. Five pairs may seem sufficient...until the day the child has five accidents. It's important to do away with frustrations if the program is to succeed, and a plentiful supply of training pants will ease frustration for both you and the child.

Obtain simple clothing

Simple clothing that's easy to get out of quickly will help the child feel good about toileting. You don't want a child to be upset because he or she has a hard time getting undressed. Nor do you want a success spoiled by the child wetting on the floor just because he or she couldn't get out of the clothes quickly enough. Here are some hints for selecting clothes:

Slacks or short skirts with loose-fitting elastic waistbands are the easiest clothes to manipulate, especially if the child wears a body brace.

A one-piece suit is not appropriate for toilet training because unfastening it and pulling it down can delay getting to the toilet on time.

If you use clothing with hooks at the waist, be sure the hooks are large and the waistband material is stiff enough to make fastening easy.

Snaps can be difficult for the young or physically handicapped child.

Velcro often works well for the child who has difficulty with hooks. A loop or leather tab attached to the zipper of pants may be very useful for a physically handicapped child. A key chain with trinkets on it may be a good incentive for pulling up a zipper, too.

Consider adaptive techniques

There are several adaptive techniques that can make toileting an easier and more pleasant experience for both you and the child. Consider adaptations that meet the needs of your child:

A stepping stool can help a small child get on the toilet. Put rubber matting on the top of the stool to help keep the child from slipping while getting on, and put rubber matting on the bottom to keep the stool from sliding. (PHOTO of child using stool.)

Any bathroom carpeting should be securely fastened so that the child won't trip or get crutches, braces, or wheelchair wheels caught.

The bathroom floor shouldn't be slippery If you don't have bathroom carpeting, use a rubber mat around the toilet.

A strap can be attached to the toilet to hold the child in place. Place the strap so that it goes either around the waist or around the chest.

Hand rails or grab bars can be placed on both sides or in the front of the toilet. Velcro on the bars will give traction. Such devices are available from hospital suppliers.

The opening to the bathroom should be wide enough to accommodate the standard wheelchair if the child uses one. This may mean removing the door.

STOP!

Do you have the following items?

12 to 14 pairs of training pants

a potty chair, adapted toilet seat, or adapted toilet chair

simple clothing

necessary adaptive techniques

No--Please do not go on to the next step until you have these materials.

Yes--Turn to the next page.

GET SET

Getting set for toilet training involves observing and recording how often a child urinates or has a bowel movement and the times of day when that happens. Recording this information is important because it will show you if the child has toileting patterns. If there are patterns, you can use them to help in the training. Taking your child to the bathroom at the right time will give you more chances to reward the child for using the toilet, and the rewards will increase the chances of the child using the toilet again.

Record the toileting program

To discover your child's toileting pattern, keep track of his or her habits of voiding for a whole week before beginning actual training. Page 24 is a schedule that will help you keep record. (There are more schedules at the back of the book.) This is how to use the schedule:

At the top, put in the date when you start the observations.

Note that some of the boxes for time cover two hours and others only one. That is because the child will most likely be asleep during the two-hour periods, and you'll probably not need to make as many entries then.

Fill in the record with these notations:

Hit-went in toilet
U-urine
S-sleep or school
Miss-went elsewhere
B-bowel movement

If the child does not use the toilet during a particular time segment, leave the box empty.

If the child goes to a sitter or school during the seven days you're observing, provide the sitter or teacher with a toilet training schedule and ask that person to fill it in so that you get a complete picture of the child's toileting pattern during the observation week.

Tear a schedule out of the back of the book and put it in a convenient place so that you don't forget to mark it. Keep a pencil with it to make the job of recording easier.

If your child asks about the schedule, simply explain what it's for. Do not, however, use the schedule to encourage the child to do better during training. That is not the purpose of the schedule. If you try to use it for encouragement, you might actually cause the child to be discouraged, especially at the beginning of the training when the chart will probably show lots of misses and few hits.

Complete the observations and recording during the normal seven-day period. If you make the observation over a holiday, when the child is ill, or any time when something out of the ordinary is happening, what you record may not be the child's normal toileting behavior so you should make a note of the unusual event on the schedule.

Take careful note of when the child goes in his or her pants by checking often and mark the results on the schedule. Checking every half hour is a good idea. Watch for telltale signs or behaviors such as grunting or a starry-eyed look. Noting wetness will be easier if the child is in cloth diapers rather than in disposables.

Be sure that your recording includes weekends as well as weekdays. Because schedules are often different on weekends, your child's toileting behavior might be different too.

If you're not sure how to fill in a schedule look at the charts on pages 47-58 that other parents have filled in.

Begin the observation and recording of your child's toileting schedule and continue for seven days.

STOP!

Have you observed and recorded the child's toileting schedule for seven days?

No--Please continue to observe your child until you get a full week's record.	Yes--Turn to the next page.

Decide if the pattern is regular

After observing for seven days, examine the completed schedule and decide if the child has regular or irregular patterns. These tips should help you decide:

If the child is regular, the schedule for each day should look almost the same. There will be some pattern to it, and you should be able to predict about when your child will need to go to the bathroom by looking at the schedule.

If the schedule is irregular, there will be no pattern or consistency.

If the child became ill during the observation period or was upset by an event such as a parental argument, a failure in learning a task at school, or a fight with playmates, there may be an irregular pattern for just a day or two. If the child is away from home part of the day, it is important to talk with the child's teacher or sitter frequently to find out if something has happened that might disturb the child and change the pattern.

If you suspect that something happened during the observation week that might have changed the child's toileting behavior, continue the observation for seven more days to be certain if there is a regular pattern or not.

After deciding if your child is regular or irregular, take an unused schedule from the back of the book and again put it in a convenient place.

STOP!

Have you determined whether your child's schedule is regular or irregular?

No--Please do not go on until you have reviewed your child's marked schedule and have posted another schedule in a convenient place.	Yes--Turn to the next page.

HERE WE GO

You have now gathered all the necessary equipment for toilet training. The observation and recording has been completed. The time has come to put your positive attitude to work. First, you will choose a signal word or sign for the need to use the toilet and teach it to the child. Then, you will follow specific steps everytime you take the child to the bathroom. You will keep track of the child's "hits" and "misses" for seven days and then check his or her progress. If you child is having problems succeeding regularly, this book will give some hints that should help.

Have necessities ready for use

Training pants

Put training pants on the child every morning. You will find it much easier to slip training pants up and down at critical times than to pin and unpin a diaper.

Simple outer garments

Double check to see that the outer garments the child will wear during training are simple to unfasten and get off.

Potty chair, adapted toilet seat, or adapted toilet chair

Place the toilet seat or potty chair in the bathroom, not in another room. You want to teach the child that the bathroom is the appropriate place to go.

If you go away from home to visit friends or relatives during the training period, take the child's toilet seat or potty along since your child is bound to be more comfortable with it than with a strange seat.

Appropriate adaptive techniques

Refer to page 14 if you have any questions about the adaptive techniques which may be suitable for your child.

Choose a signal word or sign

It is very important that you decide what term you will use for toileting. Choose a word like "potty" and continue to use this word. If your child doesn't talk, you can use a simple gesture along with the signal word. The child can use this gesture to tell you when he or she has to go.

When you take the child to the bathroom use the signal word or sign continually, beginning when you first approach the child. Use the word or sign on the way to the bathroom, when the child is on the toilet, when flushing the toilet, and when you leave the bathroom.

Hearing the word or seeing the signal often increases the chances that the child will connect the idea of "potty" (or whatever word or signal you decide on) with the act of going to the bathroom. Once the child does make the connection between the signal and trips to the bathroom he or she will soon begin to use this word or sign to let you know when there is a need to go.

Follow this bathroom procedure at all times

If your child has a regular pattern, take him or her into the bathroom about ten minutes before the time he or she would probably go.

If the child has an irregular schedule, take him or her to the toilet once an hour. Whether it is on the hour, on the half hour, or 20 minutes past the hour is up to you. Just be sure that there is always about an hour in between toileting times. Taking the child with an irregular schedule to the bathroom once an hour will greatly increase the chances of the child going in the toilet. When the child does go in the toilet, be sure to reward. The reward will help your child form a connection between going in the toilet and something pleasant (the reward). When the child makes that connection he or she will want to use the toilet again.

Guide the child into the bathroom so the child is positioned in front of the toilet or potty chair. Tell the child where you're going while doing this. Use the signal word or gesture in your explanation.

Say, "Down come ________________ 's pants," and help take down the child's pants.

Seat the child on the toilet seat or potty chair. Secure the child if necessary. Support the feet with a little stool if this makes the child feel more secure.

Tell the child to stay on the toilet seat or potty chair.

Move back from the child, always giving praise for sitting and cooperating.

Always stay with the child so that he or she is comfortable and relaxed. Talking to the child at the start may give a sense of security and comfort. Once the child seems secure, remain quiet so that he or she isn't distracted. Be as relaxed as possible yourself when you're with the child in the bathroom.

Stay near the child so that you can give praise as soon as he or she starts to eliminate. When the child starts to eliminate call attention to the fact. Make sure the child is aware of what he or she is doing by having the child listen to the sound.

Help the child off the toilet or potty chair after no longer than five minutes. If the child has gone, be sure to reward, and make sure you tell the child why you are giving a reward. Let the child look in the toilet and point out what he or she has done so the child knows why you are praising. If the child has not gone, say nothing, but remain calm and pleasant.

Let the child pull up his or her own pants, or help if necessary.

Be sure to fill in "hits" and "misses" on the training schedule.

Keep track of "hits" and "misses"

Make a careful record of the child's "hits" and "misses" on the toilet training schedule for seven days. During this time, remember to:

Let the child know what you want him or her to do.

Keep your instructions simple--use the same words over and over again.

Demonstrate exactly what you want the child to do.

Stay calm even when accidents occur. Change a wet child silently without showing facial expression.

Praise even partial successes. Encourage friends and relatives to do the same.

Choose a reward that your child really likes and that you feel comfortable with.

Use the schedule faithfully.

If the child spends time with teachers or sitters have those people read the program. Talk it over with them and be sure they are doing the same things you are.

Have the reward in the bathroom and stay with the child while he or she sits on the toilet. This way when the child eliminates you are there to reward immediately. If it's a hug, you're there to hug the child. If it's a cookie, then have the cookie where you can give it to the child right away.

If your child won't eliminate because you're in the bathroom, stand just outside the bathroom door so you are still ready to give praise immediately.

Give special consideration to the deaf-blind child

A child who can neither hear nor see relies greatly upon a sense of touch. The child cannot see your smile nor hear your praise, but can feel your touch. This has probably made diaper changing a very pleasant time--there's much physical contact then but very little on the toilet.

To counteract this, stay in the bathroom and make sure you touch the child--hold a hand, pat a shoulder, or do whatever the youngster enjoys. Give at least as much physical contact on the toilet and right afterwards as you would when changing the child.

STOP!

Have you kept track of the child's "hits" and "misses" for 7 days?

No--Do so before continuing.

Yes--Turn to the next page.

Are the "hits" on the increase and the "misses" on the decrease?

If "hits" are increasing continue recording on the toilet schedule until you have at least 11 days in a row when the child has had a number of successes. Don't expect a perfect record of successes. When you reach the goal of 11 days with many successes turn to page 43.

If "hits" are not increasing turn the page to see if you can learn why not and to find a remedy.

Try these ideas to ensure a regular schedule

If the child is not succeeding regularly, or if a relapse of "misses" occurs after a long period of "hits," the following ideas may provide some remedies. Read through them to find the one best for you and your child. Try it out. If it doesn't work, come back and try another.

Are you using the schedule?

The schedule is very important to the success of the program. If you're not using it reread pages 19-22 which explain the importance of the schedule.

Have you tried changing how you observe, praise, or take the child to the bathroom?

When you do try a change, allow a trial period of at least seven days. Without a fair trial, you can't tell if your new approach works. Of course, if it does work, continue. If it doesn't, try something else for seven days.

Have you considered how you praise and reward?

If you have a tape recorder you might turn it on to check yourself. Later you can listen to your comments objectively.

Perhaps the child doesn't like the reward you chose. Let the child suggest a reward.

Let your praise be very visible. A good guideline is to overreact.

Always tell your child why you are giving praise or a reward.

Maybe the child is bored with the reward. Try changing it. A squirt of hand lotion may be more effective than a cookie.

Don't stay with a reward if it isn't getting results. If you have any doubts about whether or not a reward is working for you change the reward.

Is the child wetting in between sometimes?

Be sure to maintain a neutral attitude about "misses." Any display of disappointment of your part can discourage the child. Check the schedule. If there is a pattern, follow this pattern. If there is no longer any apparent pattern, take the child to the bathroom every hour.

Is the child still missing although you take the child to the bathroom every hour?

If the child eliminates in his or her pants, change the child immediately without any change in facial expression or obvious disapproval. Take the child to the bathroom every half hour or even every fifteen minutes.

Is the child going in between rather than when you take him or her to the bathroom?

There are two possibilities. First, you may wish to change the hourly "go" time to meet the child's apparent needs. Remember it isn't important whether you take the child on the hour, or the half hour, or at 20 minutes past the hour. Secondly, are you SURE you praise the "hits" and ignore the "misses?"

Has the child been hitting for three weeks or longer and suddenly started missing again?

Check with the child's teacher or sitter to see if something upsetting happened while the child was away from home.

If nothing unusual has happened, go back to the methods you were using. You already know what rewards work with this child. Keep track of the schedule again. Be sure to start praising again, too. And above all, ignore the misses.

Do you feel a need to have more opportunities to praise the child for toileting correctly?
Keep on hand a variety of drinks that the child enjoys. The drinks will encourage the child to urinate. This gives you a chance to reward more frequently. Increase the liquids during the day but decrease them in the evening to discourage bedtime accidents.

Could you be doing something or not doing something you aren't aware of?
Perhaps you remark on a "miss," or perhaps you are not praising even though you think you are. Have someone, perhaps the child's teacher or sitter, watch you.

Is the child refusing to go while on the toilet?
If your child is deliberately holding back this is a sign that the child does have positive control. Try coaxing the child to urinate or have a bowel movement by running water or offering the child a drink. Then make sure the child spends at least a couple of minutes on the toilet even if he or she is reluctant. If necessary give the child lots of praise and rewards just for staying on the toilet. It is important for the child to get used to sitting on the toilet for two reasons. First, this is the place where you want the child to go. Second, the child should be on the toilet when he or she does go so that the child will connect the idea of reward with going in the right place.

Does the child seem nervous?

The child may be tense from concentrating on a demand performance. Make sure that you are relaxed with the child. Try to relax the child before he or she goes to the toilet by sitting quietly and chatting with the child on your lap or by rocking the child. Distracting the child with a favorite story while he or she is on the toilet may help too.

Would it help to have examples of other children's schedules and an explanation of their situations?

Turn to the Appendix on page 46 and examine the ideas there carefully. Perhaps they can help you with training your child.

Is the child wetting somewhat on the toilet but not completely?

This may indicate that the child does not have the necessary muscle control to be trained and a check should be made with the child's doctor.

STOP!

Is the child you are training succeeding regularly?

No--Return to pages 37-41 to
try another alternative.

Yes--Turn to the next page.

Continue to keep track of the toileting schedule

Keep a record of the child's toileting schedule for at least two more weeks. After the two weeks are over, if your child is toileting regularly, you can begin to remove yourself gradually from the training situation. You are now ready to teach the child to go independently.

Go through these five steps, one at a time. Move from one step to the next when you're sure the child will continue to use the toilet even though you are farther away. Go back a step if necessary.

1. Begin by waiting in the bathroom a few feet away from the toilet, encouraging the child from there.
2. Next take the child just to the doorway of the bathroom and wait there. Encourage the child to use the toilet alone and give praise as appropriate.
3. Then wait a few feet outside of the bathroom and praise the child when he or she has finished toileting.
4. Next, wait even farther outside the bathroom so that the child can just barely see you.
5. Finally, take the child to the bathroom and leave him or her alone.

STOP!

Is your child toileting regularly?

No—Continue to keep track of the toileting schedule and give the child another 14 days of practice.	Yes--Turn to the next page.

STOP!

You have completed the toileting program. Congratulations to you and to the child you have trained!

If you are ready to teach your child related toileting skills like appropriate dressing and undressing, getting on and off the toilet, taking paper from the roll, wiping, flushing, and handwashing you may be interested in Handwashing and Other Related Toileting Skills by the same authors.

APPENDIX

Sample schedule: Lance

Lance is five and one-half years old. Due to his small and irregular intake of both food and fluid his mother felt it would be difficult to train him. Lance began to learn about the toilet by practicing some of the toileting skills such as taking the paper off the roll, dropping it, and flushing the toilet. After this, he began using the toilet himself. He prefers to sit down using the potty seat, and he gets the seat for himself. His schedule is not regular, and he sometimes needs reminders from his mother about when to go.

It may be necessary for his mother to keep a chart of Lance's eating and drinking patterns too. By adjusting these, his mother may be able to regulate him further. Regular meals and fluid intake can help in predicting a child's schedule.

She reminds him that he is a big boy and using the toilet is very grown up behavior. Lance can repeat this and often tells it to his mother.

He tells her he has to go by dropping his pants and wiggling or simply by telling her, "I go potty now, Mommy."

After he goes, his mother responds with exuberant praise and instead of saying "Good boy," she says "Big boy."

If he misses, she casually says "Maybe next time." She says her attitude is "Praise the positive, ignore the negative."

toilet training schedule

Date: from 4/9 to 4/11

						9	10	11
		Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
A.M.	12 – 2							
	2 – 4							
	4 – 6							
	6 – 7					Up at 6:30 →		
	7 – 8							
	8 – 9							
	9 – 10					U- B- Miss		
	10 – 11						U-miss	
	11 – 12							
P.M.	12 – 1							
	1 – 2							
	2 – 3							U- Hit!
	3 – 4							U- Hit! B miss
	4 – 5							
	5 – 6							U- miss
	6 – 7							U-miss
	7 – 8						U.miss	
	8 – 9					U-miss		U-Hit/U-miss
	9 – 10							U-miss
	10 – 12							
Total hits						0	0	3
Total misses						3	2	5

Hit - went in toilet
Miss - went elsewhere

U - urine
B - bowel movement

S - sleep or school

Lance

toilet training schedule

Date: from 4/12 to 4/18

		Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
A.M.	12 – 2							
	2 – 4							
	4 – 6							
	6 – 7	5:00 a.m. U-miss	up 6:30 →					
	7 – 8							
	8 – 9							
	9 – 10		U- Hit					
	10 – 11					U- Hit		
	11 – 12		U-Hit					
P.M.	12 – 1		U- B- miss	U-miss		U-miss	U-miss	
	1 – 2	U-miss	U-miss		B ½ miss ½ Hit			
	2 – 3		U- B- miss					
	3 – 4		U-miss		U- Hit			
	4 – 5							
	5 – 6				U-miss			
	6 – 7		U-miss			U-miss		
	7 – 8					U-Hit		
	8 – 9		U-miss					
	9 – 10							
	10 – 12							
Total hits		0	2	0	1½	2	0	
Total misses		2	6	1	1½	2	2	

Hit - went in toilet
Miss - went elsewhere

U - urine
B - bowel movement

S - sleep or school

Lance

Sample schedule: Scott

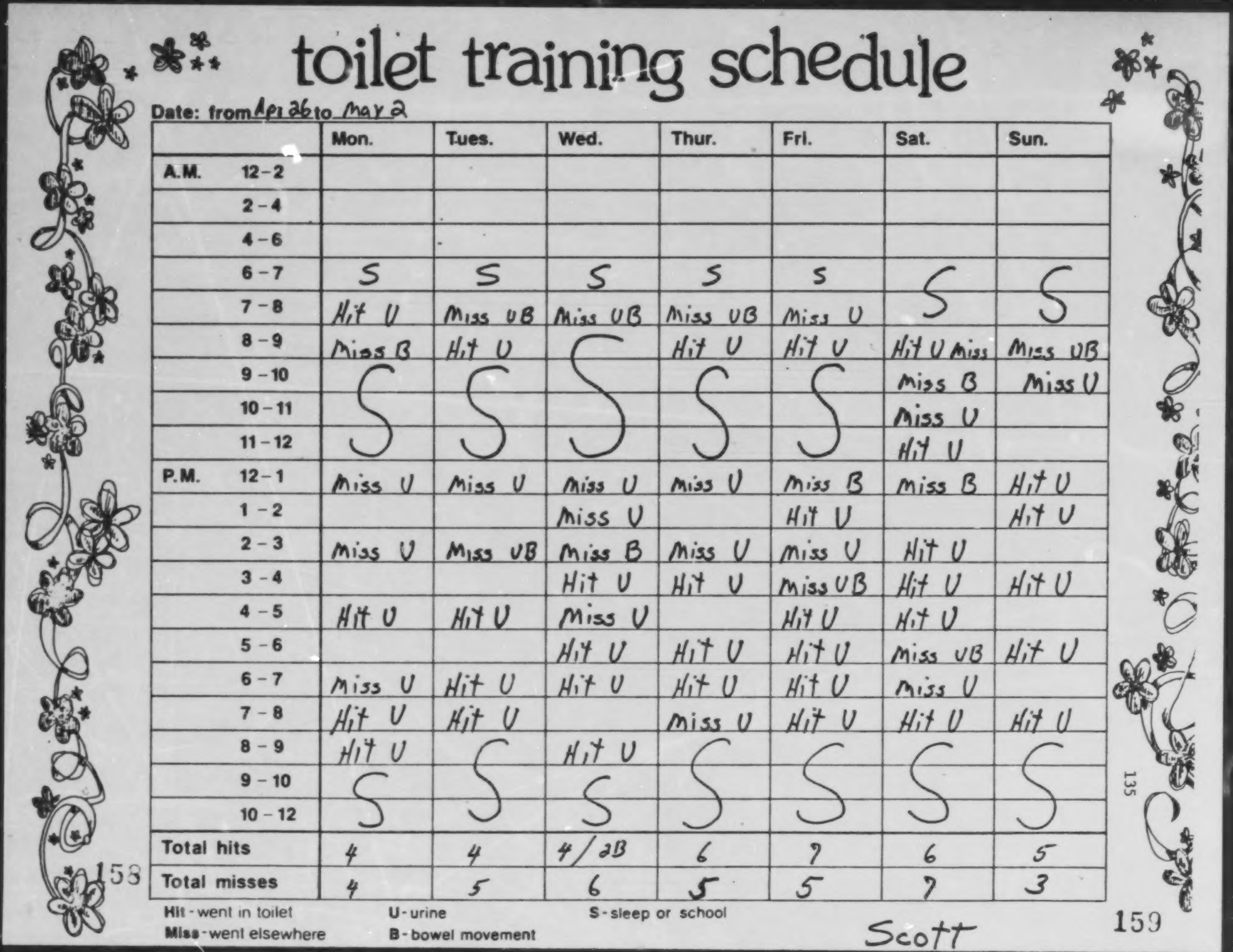
Scott, who is four, is not regular either. His mother knew that he "hit" only once a day, if that. By her use of the schedule, she learned that she and Scott were having a lot more success with toilet training than she initially thought. She said it was just coincidental that he went more but it sure made her feel better! Keeping the schedules has been Mom's reward and she gives a cookie or a peanut butter sandwich to Scott as a reward.

Although as of May 9, his "misses" were still there and unchanged, his "hits" were showing definite increase. Again, this made his mother feel good and successful.

Scott's mother takes him once an hour to the bathroom. If he does not have to go when she takes him, they leave the bathroom and she takes him again about ten minutes later. His "misses" usually occur within the ten-minute time period. This suggests that some children may have to be taken to the bathroom every half hour or that they should stay in the bathroom as long as eight or ten minutes rather than the recommended five minutes.

Scott, however, does not stay in the bathroom any longer than a minute. This has presented a serious problem for his mother, but she has now learned to take him again ten minutes later if he did not go the first time. It would, of course, be easier for her if Scott would stay in the bathroom for five minutes. Because of his unique problems, however, she has had to individualize this program.

She has also learned that if he has not gone to the bathroom for two hours, then a trip to the bathroom is appropriate.



toilet training schedule

Date: from Apr 26 to May 2

		Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
A.M.	12–2							
	2–4							
	4–6							
	6–7	S	S	S	S	S	S	S
	7–8	Hit U	Miss UB	Miss UB	Miss UB	Miss U		
	8–9	Miss B	Hit U	S	Hit U	Hit U	Hit U Miss	Miss UB
	9–10	S	S		S	S	Miss B	Miss U
	10–11						Miss U	
	11–12						Hit U	
P.M.	12–1	Miss U	Miss U	Miss U	Miss U	Miss B	Miss B	Hit U
	1–2			Miss U		Hit U		Hit U
	2–3	Miss U	Miss UB	Miss B	Miss U	Miss U	Hit U	
	3–4			Hit U	Hit U	Miss UB	Hit U	Hit U
	4–5	Hit U	Hit U	Miss U		Hit U	Hit U	
	5–6			Hit U	Hit U	Hit U	Miss UB	Hit U
	6–7	Miss U	Hit U	Hit U	Hit U	Hit U	Miss U	
	7–8	Hit U	Hit U		Miss U	Hit U	Hit U	Hit U
	8–9	Hit U	S	Hit U	S	S	S	S
	9–10	S		S				
	10–12							
Total hits		4	4	4/2B	6	7	6	5
Total misses		4	5	6	5	5	7	3

Hit - went in toilet
Miss - went elsewhere
U - urine
B - bowel movement
S - sleep or school

Scott

toilet training schedule

Date: from May 3 to May 9

		Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
A.M.	12 – 2	S	S	S	S	S	S	S
	2 – 4							
	4 – 6							
	6 – 7				Miss U	Hit U	Miss U	
	7 – 8	Miss UB	Hit U	Miss UB	Hit U miss B	Miss B	Hit U	
	8 – 9	Miss U	Miss UB	Hit U	S	Hit U		Miss UB
	9 – 10	S	S	S		S	Miss U	Miss U
	10 – 11						Miss B Hit U	Miss UB
	11 – 12						Miss UB	Hit U
P.M.	12 – 1	Hit U	Hit U		Miss UB	Hit U	Not	Hit + Miss U
	1 – 2	Hit U		Hit U	Miss U			
	2 – 3		Miss U	Miss U	Hit U			Hit U
	3 – 4	Miss U	Hit U	Hit U		Hit U	Home	
	4 – 5	Miss U	Hit U	Miss	Hit U	Hit U miss B		Miss U
	5 – 6	Miss U	Hit U			Miss B Hit U	Hit U	Hit U
	6 – 7	Hit U	Hit U	Hit U	Miss U			Hit U
	7 – 8	Hit U	Miss B	Hit U	Hit U	Hit U	Hit U	
	8 – 9	S	S	S	Hit U	Miss U	Hit U	Hit U
	9 – 10	Miss B			S	S	S	S
	10 – 12	S						
Total hits		4	6	5	5	7	5	6
Total misses		7	4	4	6	3	6	7

Hit - went in toilet
Miss - went elsewhere

U - urine
B - bowel movement

S - sleep or school

Scott

Sample schedule: Troy

Troy's mother bought him a potty chair and some training pants. He is two years old and prefers to stand. According to his mother, he is practically training himself. He decided he was "ready" to be trained and began to go into the bathroom on his own.

Even though Troy goes in on his own, his mother asks him from time to time if he has to go. Because he really doesn't talk yet, he doesn't answer her, but just leaves and goes into the bathroom. When he's on his way she reminds him to pull his pants down.

After Troy goes in his potty chair, he flushes the toilet--that's his reward! Since he began the flushing he has had fewer accidents too. Troy's secret? Because he enjoys flushing the toilet he goes to the bathroom more frequently!

toilet training schedule

Date: ~~from~~ May 2 ~~to~~

		Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
A.M.	12 – 2							
	2 – 4							
	4 – 6							
	6 – 7							
	7 – 8							
	8 – 9							
	9 – 10							
	10 – 11							
	11 – 12							
P.M.	12 – 1							
	1 – 2							
	2 – 3							
	3 – 4							
	4 – 5							hit - U
	5 – 6							hit
	6 – 7							Miss
	7 – 8							
	8 – 9							
	9 – 10							
	10 – 12							
Total hits								2
Total misses								1

Hit - went in toilet
Miss - went elsewhere

U - urine
B - bowel movement

S - sleep or school

Troy

toilet training schedule

Date: from May 3 to May 9

		Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
A.M.	12 – 2							
	2 – 4							
	4 – 6							
	6 – 7	S	S	S	S	S	S	S
	7 – 8							
	8 – 9	hit U		hit U		hit	hit U	hit U
	9 – 10	hit U	hit U		hit U	miss	miss	
	10 – 11	miss	hit U	S	miss miss		miss	
	11 – 12	hit U	miss B		miss			S
P.M.	12 – 1	S	miss		hit	hit	hit	
	1 – 2		S				hit U	
	2 – 3				- S	hit U		
	3 – 4	S	miss				S	
	4 – 5	hit U			hit U			
	5 – 6		hit U		miss B		hit U	
	6 – 7		hit U			hit U	hit U	
	7 – 8			hit U		miss		
	8 – 9			S		S		
	9 – 10							
	10 – 12							
Total hits		4	4	2	3	4	5	1
Total misses		1	3	0	3	2	2	0

Hit - went in toilet
Miss - went elsewhere
U - urine
B - bowel movement
S - sleep or school

Troy

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APPENDIX B

Handwashing and Other Related Toileting Skills: How to Teach Your Developmentally Delayed Child

HANDWASHING AND OTHER RELATED TOILETING SKILLS:
HOW TO TEACH YOUR DEVELOPMENTALLY DELAYED CHILD

by

Mary Bowman
Abigail B. Calkin
Patrick A. Grant

The research or work herein was performed pursuant to a contract with the Office of Education, U.S. Department of Health, Education, and Welfare through the Oregon Center for Research and Development in Early Education of Handicapped Children and pursuant to a contract with the Bureau of Education for the Handicapped, U.S. Department of Health, Education, and Welfare through Specialized Office Three.

Contractors undertaking such work under government sponsorship are encouraged to express freely their professional judgment in the conduct of their work. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

FOREWORD

It is a joy to parents and teachers to see a child with whom they are working achieve independence in any skill. The same feeling of satisfaction is magnified a hundred times for the child. This book was written to help parents guide their children to independence in handwashing and in other skills related to toileting. It is a supplement to a book entitled Toilet Training: How to Teach Your Developmentally Delayed Child.

Both books were originally developed in 1971 as part of a research project at the Northwest Regional Special Education Instructional Materials Center and at the Center at Oregon for Research in the Behavioral Education of the Handicapped. The present revised edition was completed by Specialized Office Three at the University of Wisconsin in 1977 at the request of the National Center on Educational Media and Materials for the Handicapped in Columbus, Ohio.

This edition is designed for the developmentally delayed preschool child. Potential users may include trainable mentally handicapped, educable mentally handicapped, or mildly physically impaired. This does not preclude its use, however, with an older child, a child with a more severe handicap, or even with a normal child.

Thanks are due to the Early Childhood Project associated with the Madison (Wisconsin) Public Schools for allowing us to photograph some of their pupils.

Appreciation also goes to Laurence Weber and Sally Bulford who edited this edition of the book, to Alan Pearlman who did the photographs and to Mary Pulliam who did the design work for the book.

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INTRODUCING TOILET RELATED SKILLS

Getting a child to tell you when there is a need to use the toilet is the first and most important skill taught in toilet training. However, there are still other skills a child must learn in order to toilet independently. By the end of the program the child will be able to perform all these skills together, but to help the child learn them they are covered here one by one. The skills assume that the child has or is working on the ability to grasp and the ability to either stand or be self-supporting with his or her arms.

These skills are

1. Approaching the toilet
2. Appropriate undressing
3. Getting on the toilet
4. Taking paper from the roll
5. Wiping self adequately
6. Dropping the paper into the bowl
7. Getting off the toilet
8. Appropriate dressing
9. Flushing the toilet
10. Handwashing

BEFORE YOU BEGIN

Teaching toilet related skills requires both physical and mental preparations. First you must be sure that the child is ready to be trained. If the child has shown a willingness to wet or have a bowel movement in the toilet independently the child is ready. Next you must be ready to invest time, while maintaining a consistent and positive attitude. Finally you must be ready to apply whatever adaptive techniques your child needs to learn the skills. This book will help with each of these steps.

Decide if you have the time

Before you begin to invest your time in this program to teach toilet related skills consider whether you have enough time and energy now to give to the task.

Do you have other children home from school with illnesses?

Are you expecting a visit from grandma shortly?

Are you going to be busy with things outside the home?

Is a holiday approaching?

Are you about to go on a vacation?

If any of those things are happening or are about to happen, this isn't a good time to begin training. Postpone the task awhile.

Set the rules of the game

The child must always know what you expect. As you go through each step of the training, keep your instructions simple. Tell the child what you want him or her to do and why. Use gestures if the child doesn't understand words. Each time you practice a skill with a child try to use the same gestures or the same instructions--word for word. Show the child what to do by doing it yourself so that he or she has a concrete example to imitate.

Be positive

In order to teach the child toilet related skills, you must believe that you are going to be successful. And you must believe it strongly enough so that the child picks up your positive feelings. Here are seven points to remember and practice all the time. It may be helpful to paper clip this page and read it over again and again during the training.

Be patient and understanding throughout the child's training.

Remember that all children develop at different rates so your child may progress more slowly or more quickly than another.

Be calm, unhurried, and relaxed.

If the child is having successes--even small ones--be sure to tell the child how pleased you are. Tell grandma, grandpa, brothers, sisters, neighbors, and friends about the program and ask them to help by praising the child's successes.

Praise or reward only those actions you would like to see happen again.

Do not expect a perfect performance and complete success for some time.

Praise your child even for partial success.

Reward the child

Rewarding a child is the most important point about being positive. When you choose a reward for the child, pick one you think the child will like and one you are comfortable with. For example, if you don't like the idea of food in the bathroom, don't pick food as a reward. If you don't feel good about a reward you may hold back from using it even without meaning to. If the child doesn't feel good about a reward, he or she isn't going to get excited about it and it won't encourage the child to do what you want. If you find that one reward you choose doesn't please your child, by all means try another. Here are some ideas for rewards:

cookies, raisins, crackers, or child's favorite snack

clapping

nodding your head

playing a game with the child

smiling

touching

shaking hands

letting the child help with housework

holding hands

singing songs

reading to the child

a squirt of hand lotion

a drink of soda, milk, water or other favorite drink

winking

hugging

patting the child's head, shoulder, or back

stroking the child's arm

listening to music

letting the child take care of pets

television

rough-housing with the child

a piggy-back ride

verbal praise ("good boy" or "good girl")

Obtain simple clothing

Simple clothing that's easy to get out of quickly will help the child feel good about undressing and dressing. Here are some hints for selecting clothes:

Slacks or short skirts with loose-fitting elastic waistbands are the easiest clothes to manipulate, especially if the child wears a body brace.

If you use clothing with hooks at the waist, be sure the hooks are large and the waistband material is stiff enough to make fastening easy.

Snaps can be difficult for the young or physically handicapped child.

Use these techniques

Teach each skill separately. Follow these steps in sequence:

1. Reward the child every step of the way.
2. Act as a model by showing the child exactly how to do each skill.
3. Explain each step of the skill simply and repeat that simple explanation each time the child repeats the skill. Try to use the same words every time.
4. Physically guide the child through all parts of the skill being taught while you explain each step.
5. Physically assist the child through the first part of the skill being taught. Let the child finish the skill alone while you explain each step.
6. Tell the child what to do so that he or she can do the skill alone.
7. Watch the child perform the skill at least three different times.
8. Begin teaching the next skill.

NINE RELATED SKILLS

STOP!

Is the child able to approach the toilet?

No--Consider and, if appropriate, make these changes in your bathroom:

Fasten carpeting securely so that the child will not trip.

Make sure the door is wide enough for a wheelchair if your child uses one. This may require removing the door.

Turn to the next page and begin training in this skill.

Yes--Proceed to page 14.

Approaching the toilet

1. Take the child to the bathroom. Lead him or her by the hand or put your hand on the child's shoulder as you walk toward the bathroom. Explain where you are going. Guide the child who uses crutches or a walker, or who is in a wheelchair, toward the bathroom as you explain your destination.
2. If possible, start the child toward the toilet from the bathroom doorway while saying, "Go toward the toilet."
3. Remain at the doorway and watch the child approach the toilet.
4. Praise the child when he or she reaches the toilet.

STOP!

Is the child able to undress appropriately alone?

No--Review the ideas on simple clothing on page 9. Turn to the next page and begin training in this skill.	Yes--Proceed to page 16.

Appropriate undressing

1. Instruct the child to pull pants down or skirt up.
2. Start assisting the child to undress, if necessary. At first you may help the child by pulling the pants down almost all the way and then letting the child finish.
3. Watch the child complete the task.
4. Make sure the child lowers pants enough so that his or her knees can be spread apart.
5. Praise any attempts the child makes to undress alone.
6. Practice this skill with the child at bedtime or at nap time.
7. Gradually reduce the amount of help you give so that the child will do more for himself or herself.

STOP!

Is the child able to get on the toilet?

No--Consider these adaptive devices and acquire them if necessary:

A stepping stool for a small child. Rubber matting on the top of the stool will help the child get on and rubber on the bottom will keep the stool from sliding.

Hand rails or grab bars. These can be placed on both sides or in front of the toilet. Velcro on the bars gives added traction.

Turn to the next page and begin training in this skill.

Yes--Proceed to page 18.

Getting on the toilet

1. Tell the child to get on the toilet.

2. Help the child if necessary.

3. If you're using a standard toilet and the child has difficulty sitting on it, consider these ideas:

   The child can sit on the toilet seat backwards (facing the tank) and use the tank top as an arm support.

   The child can sit sideways using the toilet tank, grab bars, or a hand rail as a support.

   The child can face forward and use grab bars for support.

4. Reward the child for getting on the toilet.

STOP!

After the child has urinated or had a bowl movement, is he or she able to take the paper from the roll and grasp it?

No--Turn to the next page and begin training in this skill.

Yes--Proceed to page 20.

Taking paper from the roll

1. After the child has urinated or had a bowel movement, help the child pull and tear enough paper from the roll to wipe. These suggestions may help:

   Leave some paper hanging from the edge of the roll.

   Place the paper in the most appropriate spot for the needs of the child whom you are training. Consider whether it is best in front of the toilet or on the right or left side.

   Make sure the paper is not too high nor too far away for the child to reach.

   Use a stop to limit the number of sheets that come off the roll at one time.

   Tear the paper in advance for the child and leave it in a convenient place.

   Use an extended toilet paper holder that can swing in front of the child when needed and away when no longer needed.

   Place the roll on a dowel attached to a flat board.

2. Tell the child to grasp the paper and help the child do this.
3. Praise the child for taking the paper from the roll.
4. Have the child practice wadding the toilet paper. If the child has only one free hand, have the child practice gathering the paper together against his or her legs or a convenient surface such as the wall.

STOP!

Is the child able to wipe adequately after urinating or having a bowel movement?

No--Remember to praise every step toward success. Turn to the next page and begin training in this skill.	Yes--Proceed to page 22.

Wiping Adequately

1. After the child has the paper in hand, tell the child to wipe with it. Girls should be instructed to wipe from front to back for sanitary reasons.
2. Encourage the child to do as much of the wiping motion as possible unassisted, but help as necessary.
3. Help the child through the entire motion of wiping, if necessary.
4. If the child is able to wipe but is not thorough enough, ask the child to do it again.
5. Praise the child for efforts to wipe adequately.

STOP!

Is the child able to drop the paper when told?

No--Practice dropping other objects to help the child learn to release. Give the child additional practice in aiming.

Turn to the next page and begin training in this skill.

Yes--Proceed to page 24.

Dropping the paper in the bowl

1. When the child is finished wiping, instruct him or her to drop the paper.
2. Start the child's hand toward a position where he or she can drop the paper into the toilet.
3. If necessary, help the child release the paper and drop it into the toilet.
4. Remember to praise the child for his or her efforts.

STOP!

Is the child able to get off the toilet when asked?

No--Remember that hand rails or grab bars placed on the sides or in front of the toilet can be really helpful--particilarly when covered with Velcro for traction.

Turn to the next page and begin training in this skill.

Yes--Proceed to page 25.

Getting off the toilet

1. When the child has dropped the toilet paper, tell him or her to get off the toilet.
2. If the child is physically unable to stand, place your hands under the child's arms to help lift him or her up.
3. Don't forget to praise!

STOP!

Is the child able to pull pants up after getting off the toilet?

No	Yes
No--Review the ideas on simple clothing on pages 9 and . Continue to reinforce all marginal steps toward correct behavior. Turn to the next page and begin training in this skill.	Yes--Proceed to page 28.

Appropriate dressing

1. Help the child take hold of the training pants and slide them up to the waist.
2. Help the child slide up outer pants as necessary.
3. Help the child fasten outer pants as necessary.
4. If the child you are training has braces or is in a wheelchair or on crutches consider this sequence:
    a. Have the child pull up both training and outer pants to the knees or higher before standing.
    b. Have the child stand up with the help of a hand rail or grab bar.
    c. Tell the child to hang on with one arm or lean against the rail or bar.
    d. Instruct the child to pull the pants up with the free hand.
    e. Help the child with braces or crutches to complete any necessary fastening.
    f. Tell the child in a wheelchair to complete the fastening when seated.
5. Praise the child's efforts to dress appropriately.

STOP!

Will the child you are training flush the toilet when asked to do so?

No--If the child is physically handicapped, try having him or her flush the toilet before getting off.

Turn to the next page and begin training in this skill.

Yes--Proceed to page 50.

Flushing the toilet

1. After the child has pulled the pants up, guide the child's hand to the handle of the toilet.
2. Tell the child to flush the toilet and at the same time push down firmly on the child's hand to help out.
3. If the child you are training is physically unable to use the standard handle on the toilet, consider one of these techniques:

   Drill a hole in the standard handle. Attach to the toilet handle a heavy cord or wire. Extend it down to the floor and attach it to a pedal device that will flush the toilet when depressed with the foot.

   Take two pieces of wood and make a splint. Tape them to the handle. Cover this splint with Velcro for traction.

3. Remember, if the child you are training enjoys flushing the toilet, this could be used as a reward when the child "hits."

Rinsing

ONE LAST SKILL - HANDWASHING

STOP!

Is the child able to complete the skill of handwashing?

No--Turn to the next page and begin training in this skill.

Yes--Proceed to page 317

The easiest way to teach the skill of handwashing is to break it into the following steps:

1. Going to the sink
2. Turning on the faucet
3. Rinsing
4. Soaping
5. Washing
6. Rinsing
7. Shaking off the water
8. Turning off the faucet
9. Getting the towel
10. Drying
11. Putting away the towel

Another way to ease the child into learning this skill is to apply some adaptive devices.

Try these adaptive devices

A special sink with a cut-out portion for a child who uses a wheelchair.

Grab bars installed near the sink in several different positions:

- around the sides and front of the sink in a "U" shape
- at the front of the sink
- on the wall beside the sink
- on top of a built-in cabinet
- to the floor in front of the sink in a "U" shape

Extenders placed on regular faucet handles. This extension can be made by simply attaching two wooden slats to the faucet with tape.

Adjustments related to the use of the soap:

- Drill a hold through the middle of the soap and attach a string to it. The soap can then be hung over the faucet or on a nail by the sink.
- Prevent the soap from sliding by placing it on a suction holder or on a soap dish with suction cups on the bottom.
- Use a terrycloth mitt that has a pocket sewn in the palm for the soap.

Possibilities to help the child use a towel:

Install a roller rack with a continuous towel (one sewn together at the top and bottom edges).

Sew a washable slip-on wrist band to a towel.

Cover a dowel or towel rack with foam rubber or Velcro to give traction.

Use a stuffed terrycloth animal as a towel.

Use a terrycloth mitt.

STOP!

Have you reviewed the adaptive devices for handwashing and added those that are suited to the needs of your child?

No--Implement the necessary adaptations before continuing.

Yes--Turn to the next page.

STOP!

Is the child able to go to the sink when asked?

No--Remember that grab bars in different positions near the sink may be helpful: around the sides and front of the sink in a "U" shape at the front of the sink on the wall beside the sink on top of a built-in cabinet on the floor in front of the sink in a "U" shape If the child is in a wheelchair make sure that he or she is able to approach the sink from the front or side. Turn to the next page and begin training in this skill.	Yes--Proceed to page 37.

Going to the sink

1. Tell the child to go to the sink.
2. Walk or guide the child to the sink if necessary.
3. If the child is in a wheelchair, approach the sink sideways. Be sure that the water pipes under the sink don't touch the child's legs. If the pipes will be close to the child's legs, make sure the metal is wrapped with non-conducting tape so the child doesn't get a shock.

STOP!

Is the child able to turn on the faucet?

No--Reconsider this idea:.

Regular faucet handles can be extended by simply attaching two wooden slats with tape.

Turn to the next page and begin training in this skill.

Yes--Proceed to page 39.

Turning on the faucet

1. When the child is at the sink, place your hand over his or her hand.
2. Lead the child's hand to rest on top of the faucet.
3. Tell the child to turn on the faucet.
4. Help the child to turn the faucet on, if necessary.
5. Praise the child for turning on the faucet.

STOP!

Is the child able to rinse?

No--Turn to the next page and begin training in this skill.	Yes--Proceed to page 41.

Rinsing

1. Once the faucet is on tell the child to put his or her hands in the running water.
2. If the child can do this alone, stand beside the sink and watch.
3. Stand behind the child and put his or her hands under the water if the child needs help.
4. Reward the child for rinsing.

STOP!

Is the child able to perform the task of soaping?

No--Consider using one of these suggestions:	Yes--Proceed to page 43.

Drill a hole through the middle of the soap and attach a string to it. The soap can then be hung over the faucet or on a nail by the sink.

Prevent the soap from sliding by placing it on a suction holder or on a soap dish with a suction on its bottom.

Turn to the next page and begin training in this skill.

Soaping

1. After the child has completed rinsing, tell the child to take the soap in his or her hands.
2. Tell the child to soap his or her hands and to stop rubbing when they are soapy.
3. Help the child rub soap on his or her hands if necessary.
4. Remember to praise the child for soaping!

STOP!

Is the child able to rub his or her hands together after they have been soaped?

No--Try using a clip-on brush or suction cup brush for scrubbing if the child has difficulty with the wringing motion.

Turn to the next page and begin training in this skill.

Yes--Proceed to page 45 and instruct the child in rinsing for the second time.

Washing

1. After soaping, tell the child to move his or her hands in a wringing motion so that both the fingers and palms are scrubbed.
2. Help the child with the wringing motion if necessary.
3. Don't forget to reward!

Rinsing

You should have already taught this skill, so simply instruct the child to rinse his or her hands. If necessary, review page 40. Turn to the next page.

STOP!

Is the child able to shake off the water?

No--Turn to the next page and begin training in this skill.	Yes--Proceed to page 48.

Shaking off the water

1. After the child has rinsed, take hold of his or her lower arms.
2. Go through a shaking motion with the child and at the same time tell the child to shake his or her hands.
3. Praise all attempts at shaking off the water.

STOP!

Is the child able to turn off the faucet?

No--Reconsider placing extenders on the regular faucet handles. See page 37 for details.

Turn to the next page and begin training in this skill.

Yes--Proceed to page 50.

Turning off the faucet

1. After the child has shaken off the water, place your hand over the child's and guide it to the faucet.
2. Tell the child to turn off the faucet.
3. If necessary, help the child turn off the water.
4. Give praise for any attempts to perform this skill.

STOP!

Is the child able to get the towel?

No--Consider these adaptive possibilities:	Yes--Proceed to page 52.

a roller rack with a towel sewn together at the top and bottom edges

a washable slip-on wrist band sewn to a towel

a dowel or towel rack covered with foam rubber or Velcro

Turn to the next page and begin training in this skill.

Getting the towel

1. After the child has turned the faucet off, move the child's hands to the towel.
2. Tell the child to get the towel.
3. Help the child grasp the towel if necessary.
4. Reward the child for performing this task.

STOP!

Is the child able to dry his or her hands?

No--Remember that a stuffed terrycloth animal could serve as a nice reward as well as a way of accomplishing this task. Turn to the next page and begin training in this skill.	Yes--Proceed to page 54.

Drying

1. When the child has the towel in the right hand, cover the child's hands with yours.
2. Tell the child to dry the hands.
3. Help the child blot the water off the left hand. If the child is left-handed, just reverse these instructions.
4. Help the child change hands and fold the towel in the left hand to blot the right.

STOP!

Is the child able to put away the towel?

No--Try using a hook instead of a rack to hang the towel on.

Turn to the next page and begin training in this skill.

Yes--Proceed to page 56.

Putting away the towel

1. When the child's hands are dry, guide the child's hands to two corners of the towel and over the edge of the towel rack.
2. Instruct the child to put the towel away.
3. Help the child let go with the right hand and grab the right corner under the rack.
4. Help the child let go with the left hand and grab the left corner under the rack.
5. Help the child pull down on the corners gently.

STOP!

You have finished the last of the related toileting skills. Congratulations to you and the child you have trained!

APPENDIX C

PROPOSED MODEL FOR ADAPTING "CAREER DISCOVERIES" FOR USE WITH EDUCABLE MENTALLY HANDICAPPED STUDENTS

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November, 1976

The Wisconsin Research and Development Center for Cognitive Learning

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I. INTRODUCTION

The purpose of this paper is to evaluate and adapt the Guidance Associates Vocational education materials "Career Discoveries" for use with educable mentally handicapped students. "Career Discoveries" is a set of six boxes of four sound filmstrips each, designed for use with students in grades 5-9. Accompanying each box is a discussion guide containing script, vocabulary, and activities. Each set of filmstrips centers on a broad vocational area with one introductory film and three job topics. To meet the adaptation objectives with these materials, the learning characteristics of the population which will receive these materials was determined and described, the comparable products reviewed, and a prototype teachers' guide designed.

Initially, it is critical to set out the parameters and characteristics of the target population. This is the key to specific and objective evaluation of the materials in regard to the academic objectives stated in the program, and also an important consideration for marketing the adapted product. Nationally, the prevalence of school aged children characterized as educable mentally handicapped (EMH) is approximated at 2.5% (Secretary's Committee on Mental Retardation, 1969). The word "approximated" must be stressed here as the label is at best a slippery one. The definition varies not only from state to state, but also from school to school. The student with low intelligence is prey to being labeled, grouped, or classified in accord with the needs and philosophies of the professionals who deal with him/her. A doctor, for example, may view the student in terms of his/her physical defect; an educator may regard the same student in terms of his/her performance and this, in the context of the school's facilities for dealing with him/her.

Recent legislation (Wisconsin Statutes, Chapter 115) has forced school districts to define the EMH population for funding purposes. This process involves establishing I.Q. limits, usually in the range of 50 to 80 on a standard intelligence test with a mean of 100 and standard deviations of 15 or 16. Accompanying an I.Q. score is a computed mental age (MA), as differentiated from a chronological age (CA).

The mental age ratio is calculated with the formula: $MA = \frac{(IQ)CA}{100}$. Thus, in a population of children with I.Q.'s varying from 50 to 80 and chronological ages of 10 to 14 (grades 5-9) the mental ages range from 5 through 10.4. Mental age provides a framework for viewing learners of similar chronological ages who function at differing intellectual levels. It is acknowledged that controversy surrounds I.Q. and testing. Whether valid or not, the index is used in educational settings to determine which children will be placed in special education programs.

There are basically three causes for mentally handicapping conditions: genetic, organic, and environmental. The first two are rather straight-forward in their etiology. Environmentally-related "retardation," however, is a far less specific area. Given a specific child with a specific range of possible intellectual development, environmental factors will influence whether he/she will perform and develop at the upper, middle, or lower portion of his/her range. A variety of less than desirable home, family, or school situations, can push a child into the arena of special education. This environmentally-influenced group comprises the largest population of students found in "special" and EMH classrooms and programs.

It should be obvious that the population of school children in the U.S. classified as EMH is diverse, to say the least. It is diverse not only as parameters and programs vary, but also enormously diverse in terms of the different needs of different individual learners. As will be discussed, the needs of a particular EMH student may be amazingly diverse as well.

SPECIFIC LEARNER CHARACTERISTICS OF THE EDUCABLE MENTALLY HANDICAPPED POPULATION

One of the major concerns when planning an educational program for mentally handicapped children is that of individual differences. It is difficult to describe the usual behavior and learning styles of an educable mentally handicapped (EMH) child in any but the broadest of terms. A wide range of behaviors prevail. As a result, "it would be unjustifiable to claim that all retarded children have specific traits to the same degree and in similar patterns (Smith, 1971)." Nevertheless, there are general learning and behavioral characteristics which typify many of the mentally handicapped.

Academic Characteristics

1. The rate at which the student progresses equals the rate of his mental development, which is about 1/2 to 3/4 the rate of the average child. Obviously, the handicapped student should not be required to complete in one year's time the same amount of material that the average student is expected to complete.
2. The student may display limited vocabulary development and have difficulty communicating his/her thoughts and ideas to others.
3. The EMH student may progress slowly from the readiness level of performance to the initial stages of reading, mathematics, and writing. He/she may not begin to acquire some of the skills of an average six year old until he reaches age eight or nine. The overall reading levels of an educable mentally handicapped child rarely go beyond those of an average fifth or sixth grade child.

Intellectual Characteristics

1. The student may have difficulty following a progression of events particularly in a situation without a clear organizational pattern.

A student often responds more readily to materials that include an intentional instructional sequence which provides him/her with explicit input data.

2. The EMH student may find it difficult to deal with abstractions and may tend to resort to concrete information.
3. The EMH student may be unable to generalize information from one situation to another. This means that the student may not be able to transfer knowledge in one area or subject matter to another area without loosing sight of the relevant information.

Processing Characteristics

1. The EMH student may find it difficult to process complex information. That is, the handicapped child may have difficulty understanding information that is presented as a whole rather than information that is broken down into small, sequential steps.
2. Handicapped mental development may include the inability to perceive stimuli through certain sense modalities. Sometimes handicapped students are unable to receive or transmit information through one or more of the sensory modes: auditory, visual, verbal, or tactile. Some students may need a combination of these in order to comprehend the information.
3. The student may have difficulty retaining information without subsequent presentations. Some students need continuous repetition of input presentation in order to grasp the concepts that are presented.
4. The EMH learner may be unable to establish associations with information that is presented as he/she may not be able to relate his/her past experiences to the learning situation. That child may need an environment which provides a wider range of experiences that would aid in the understanding of specific information that is presented in the classroom.

Personal and Social Characteristics

1. Sometimes the student is distracted by the presence of peripheral stimuli and is unable to concentrate on the task that is at hand. Frequently, the distraction is of secondary importance at this particular time.
2. The EMH student may exhibit a low tolerance for frustration. The handicapped student often has experiences with being unable to perform tasks which might be expected of students of his/her chronological age.

It is imperative to remember that differences exist among handicapped children. Equally important is the fact that the needs of a specific learner will change from one time to another, based on specific situational pressures. In addition, there may be additional curricular needs of the mentally handicapped, thus, the learner characteristics must be viewed as dynamic, rather than static in nature.

After looking at the characteristics of the EMH learner, the next matter for deliberation is how to structure and present appropriate materials enabling specific goals to be attached.

ADAPTING MATERIALS TO THE EDUCABLE MENTALLY HANDICAPPED POPULATION

In applying the above educational characteristics to the learning situation, some specific requirements for curriculum materials emerge. The over-riding concern is structure at all levels for both student and teacher. In the broadest sense, this structure should be inherent in the presentation format of the material. In another sense, structure binds learning activities in a functional way to the presentation. In still another sense, behavioral objectives must be employed in a structured design to ascertain whether students are meeting the educational goals of the program.

It has been shown that educable mentally handicapped students have difficulty processing a variety of information presented simultaneously, or in a relatively short span of time. One way to overcome this difficulty is to create an obvious structural latticework manifest in the learning situation. This provides the student with an intellectual set to which he/she may relate ensuing information. Given that successful learning and remembering are a function of the formation of meaningful associations between existing knowledge and new information (Bruner & Oliver, 1963), lack of opportunity to effectively form these associations will result in low comprehension, low retention, and low recall of information (Osborn, 1960). Though a presentation may seem logically structured to a normal child or to an adult, if it does not elicit meaningful associations for the EMH student, there is a strong possibility that much of the content will appear random and meaningless to him/her. In practical application a presentation must be clearly organized around a concept that the EMH learner knows well. Such a format promotes attending behavior and, thus greater retention.

Structure also plays an important role in the integration of activities which precede and follow a learning presentation. By familiarizing the student with new words, concepts, and manipulatives in an active learning situation *before* a presentation, the actual experience (filmstrip, for example) becomes a reinforcer rather than an introduction. The student's conceptual framework is strengthened and he/she is better able to assimilate the new information. A review of the concepts following such a presentation, provides an opportunity for assessment and additional reinforcement. Reinforcement, repetition, active and varied learning experiences all within a clear structure will provide an optimal learning situation for the EMH learner.

To structure curricula for the EMH student and his/her teacher, it is necessary to evaluate. Efficient goal setting comes as a compellation of handicapping conditions, entry skills, and content. Once these goals have been established, appropriate behavioral objectives are derived. These sub-goals must be straight-forward and satisfied by easily observed behaviors. They should appear often enough in the material to function as indicators of mastery, as well as a "take-off point" for the next set of concepts. Similarly, predetermined assessment should show exactly which children need what type of intervention before, during, and after each activity. Determining the appropriate learning activity becomes a clearer and more precise task for the student and instructor when goals, objectives, and planned assessment are used.

In conjucntion with overall structural considerations, specific teaching techniques have been shown to greatly enhance learning and memory in educable mentally handicapped students. Those who prepare materials should be aware of these techniques and incorporate their use into the materials.

It is important to present learning experiences in such a way as to allow the child to progress at a rate compatible with his/her development. In doing so, it may be necessary to space repetitions of a single concept over time to allow the child to fully assimilate the concept before moving on to new material. The materials should provide a sufficient repetition of experiences to develop over-learning; that is, continued opportunity for giving proper responses beyond the point of initial mastery. Overlearning may also be facilitated by providing a number of diverse activities for one specific concept. Similarly, materials should be presented in a systematic step-by-step fashion, identifying basic components of a task and ordering them in a hierarchical manner. Each skill should provide the necessary foundation for an adequate performance at the following levels. All materials should deal with concrete information, not abstractions, and should be phrased succinctly and explicitly. This will aid the student in initial recognition and leave him/her with little doubt as to the required task.

Materials and the manner in which they are presented should allow for positive transfer of knowledge from one situation to another. In presenting a concept, the materials should be carefully structured so that the stimulus is presented in various situations and relationships, allowing the student to transfer the common elements of each. In addition, attention should be given to varying and combining the sense modalities which are required for processing the information. In utilizing materials which require auditory, visual, verbal, and/or tactile stimulation and response, a EMH student may be aided in receiving and transmitting information more efficiently.

Just as certain methods of presentation must be recognized, it is also important to be aware of the specific kinds of tasks included. Tasks involved in a presentation should not only enhance learning, but also reinforce the materials. Primarily, tasks should be uncomplicated and include the fewest possible number of elements. Attention should be given to avoiding abrupt shifts between concepts and activities so that the student can attend to the most important aspects of a particular task.

An important consideration is awareness of the importance of high interest materials. The typical student needs materials that arouse his/her interest and provide for active participation. The learning condition should be arranged so that the student is active rather than passive. The student is thus encouraged to focus his/her attention on the specific activity in which he/she is involved and feels an important participant in the learning situation.

Similarly, frustrating situations should be avoided. Tasks should be arranged for success, eliminating the chance of major setback. It is also absolutely necessary that the student be provided with continuous feedback on the correctness of his responses. Positive reinforcement should immediately follow. In summary, materials to be presented to, or used by, educable mentally handicapped students should be structured throughout. The specific learner characteristics of EMH students dictate the format of both the materials and the reinforcing activities. Research has shown that once a retarded student has learned an association, he/she is able to remember it as well as a normal child (Baumeister, 1967). Thus, the key issue is the care with which materials are prepared to assure that the EMH learner does indeed establish the appropriate associations.

II. REVIEW OF COMPARABLE PRODUCTS

To conduct a review of comparable vocational education products, a search was made of two major, computer-based information services -- Educational Resources Information Center (ERIC) and National Instructional Materials Information System (NIMIS). The ERIC search yielded 47 items which were drawn from two areas: Current Index to Journals in Education and Resources in Education. 1968 was the earliest year accessed for both areas. The NIMIS search yielded 223 items, no date parameters were established. Both printouts provided abstracts and publication information. It should be noted that the ERIC search accesses everything within the two above-mentioned areas and the NIMIS search confined to materials that may be used with handicapped children. It should also be noted that NIMIS accesses actual curriculum materials, while ERIC accesses publications. Copies of the print-outs may be found in Appendix A.

Two major trends appear in vocational materials in general. At the secondary level, there is a multitude of information available on career choice -- decision-making with regard to self-awareness, education, and the range of career possibilities. Most materials are in the form of textbooks, films, or film loops. Emphasis is also given to job skills education. Here, once again, textbooks and specific film topics dominate, with some packets of materials about narrow vocational areas. While some effort has been made since 1970 to gear job choices to a wider spectrum of possibilities (including some unskilled positions), generally, the careers presented pre-suppose at least a high school education. Consequently, the reading level tends to be junior high and above.

The other major trend is in the area of primary level vocational packages. These filmstrips and books tend to deal with affective development in a general sense or center on one career at an extremely elementary level. As a result, there is little continuity from the important self-awareness aspect at the primary level to the equally important specific choices and skills offered to the secondary student.

The survey of materials revealed a lack of materials for adolescent educable mentally handicapped students. The instructor has a choice between presenting primary-level subject matter that is grossly unrelated to the student's vocational needs or, unrealistic career choices displayed in material well above their comprehension level. The other alternative is no career awareness training at all -- only vocational training. The need for material geared to an appropriate academic level, containing a continuum of realistic careers for the EMH learner is apparent.

In field testing the Guidance Associates materials and researching the field of vocational needs of this population, contact was made with several teachers of junior high and secondary level EMH students, as well as with placement agencies (Project SKILL, 1976) dealing exclusively with handicapped persons. Contact was also established with EMH students aged 12 to 15 (mental age 8 to 11) in a classroom. A summary of these experiences may be helpful at this point.

Some of the Guidance Associates materials were informally presented to a classroom of students at a residential school in the Madison area by project staff members (both having a background in special education as well as being certified teachers). The students enjoyed the presentation enormously, but closer questioning revealed that much of what they retained was concrete and idiosyncratic and did not meet the goals of the Career Awareness materials. In the follow-up it became clear that these students had little idea of appropriate careers. In fact, they could not name "jobs" except those of their parents. They also showed lack of understanding of the personal relations implications of a vocation: how people get to their jobs, how they spend their money, who they eat lunch with, whether they "like" working, etc. They expressed their desire to know about these aspects of working.

Later, when project staff members spoke with personnel, it became apparent that while well-trained employees tended to keep their jobs, they encountered the most severe problems with concerns paralleling the issues raised by the students: unrealistic expectations and relations with other employees. While there is no data available to support the relationship at this time, it was stated by several persons who worked with EMH employees that those who had been involved in vocational education programs achieved a higher level of job success. They also expressed a strong affirmation of the need for career awareness and career expectation materials for these students "the earlier, the better."

In conclusion, there is a need for materials like those that Guidance Associates have developed--a developmental sequence of career education materials that begin with affective development and values, progress through specific career awareness activities, and narrow to choices and skills at the secondary level. Materials adapted as suggested below would not only meet the needs of the EMH student, but also the slow learner, the intermediate grade school child, and the normal student with low-reading level or perhaps a particular interest.

III. PROPOSED CHANGES FOR ADAPTATION

The "Career Discoveries" format of a filmstrip, cassette, and first person narration was highly interesting and motivating for the educable mentally handicapped learner. Similarly, the organizational structure of introductory filmstrip with specific jobs in a designated area is a sound one. Implementation of changes in content and learning activities would enhance the appropriateness, as well as the potential for retention of information for the EMH student, grades 5 through 9.

Specifically, the organization of filmstrips in each area may be further reinforced by integrating a predictable pattern of presentation consistent among filmstrips. A "day in the life" format for each filmstrip would provide a constant temporal referent for the students. The first filmstrip should continue to introduce each of the careers in addition to establishing a set for the kinds of information that each character will consistently present. To provide additional reinforcement and repetition, two to three different persons would appear within each specific job filmstrip. Thus, in the proposed box of materials "People who work in Food Services" a student would find an introductory filmstrip with two or three persons illustrating the day of a waiter/waitress, a cook, and a food packager.

The variety of abilities characterizing the EMH population is an additional reason for providing more than one illustration of each career. Students may find themselves on a continuum of abilities in the areas of social skills, task persistence, and task complexity. If one goal of the program is to acquaint the student with a variety of careers as an aid to his/her drawing some valid conclusions concerning career possibilities, then he/she must be aware of the reasons for identifying in some way with one character rather than another.

Furthermore, a "day in the life" format with first person narration would reveal how people relate jobs to their lives. Most of the students who viewed the "Career Awareness" materials had little conception of "jobs" except as something "you do everyday." Transportation, free time, housekeeping, social responsibilities, or situations arising from conflict between these areas and employment are areas the adolescent handicapped learner must become aware of, particularly in view of the concerns voiced by placement personnel.

Within the framework of consistancy, repetition, and predictability any number of career possibilities emerge as appropriate. Unskilled to semi-skilled positions within each career filmstrip are proposed in this prototype box. Careers most frequently mentioned by persons placing EMH learners are food service workers, building maintenance helpers, laborers, storekeepers, clerks, typists, stock clerks, machine operators, key punch operators, and shipping and mailing clerks. Of note is that these positions may be appropriate for normal as well as EMH students.

As for level and type of content, given the mental ages of the target population (5 - 10.4 years) presentations should be geared to third grade reading level. Similarly, abstractions should be minimized, associations or relative comparisons, concrete. For example, in the "chef" filmstrip, the character refers to the size of his ovens, refrigerators and pots in a concrete, salient manner. When the students were questioned after the filmstrip, this information was easily recalled. High interest persons, events and locations should continue to be emphasized but within the context of realistic job possibilities.

Running through each character's presentation should be specific responsibilities on the job, responsibilities at home, people to whom they relate, planning, transportation, free time, work schedules, the importance of promptness and cleanliness, and the satisfaction he/she gains from a job done well. Accompanying activities would expand and reinforce the same concepts.

The teachers' guide format for the prototype kit is appended with activities and suggested summaries for the filmstrips. Basically, more specific goals have been added, in addition to behavioral objectives for the program, the proposed box, and each filmstrip. Used in conjunction with provided pre- and post- assessment tools, these behaviors will indicate to the instructor and student whether goals are being achieved. The vocabulary section is geared to third grade reading level, as are reading and writing activities.

Activities are designed with consideration for maximum versatility. Some are designated as mandatory (as indicated by an asterisk) to help meet the goals of the program, and to insure that each student, regardless of teacher or environment, experiences "Career Discoveries" as fully and consistently as possible. Instructions to the teacher as to materials and verbalization are specific, as is the sequence of activities. Thus, a given instructor has the choice of using the minimum amount of structure for those students who show by pre- and post- assessment to be mastering the material or varying amounts of extra input depending on interest, mastery level, or initiative of the learners.

This format takes into consideration the varied manner in which EMH students are accommodated in instructional settings. For the self-contained classroom, activities may be used with the whole class, by individuals, or in some combination of the two. For example, the instructor may show the filmstrip to the entire class, but then assign written activities to more verbal students and active participation activities to others. Conceivably, a student could experience the whole program individually with little assistance from the instructor as in a resource room setting. Thus, the activities and objectives are designed for prescriptive teaching -- systematic, but with many alternatives.

Included below is a prototype teachers' guide. Time and space have limited the amount of material appended. Representative detail for filmstrip #2 shows the format of the adapted "Career Discoveries" of materials. Goals, objectives, vocabulary, and activities are not included for filmstrips #1, 3, and 4, though a suggested summary for each is provided.

IV. IMPLICATIONS

In viewing the proposed adaptation of the "Career Discoveries" materials in a larger framework, marketing implications for both population and materials emerge as an interesting point for expansion. The proposed changes and development would present an excellent opportunity for Guidance Associates to incorporate the physically handicapped student into the target population. This may be accomplished by adding handicapped characters to the filmstrips, and perhaps discussing their disabilities and lifestyles. In reference to the search for comparable products, there would seem to be a lack of career awareness material for the physically handicapped as well as the educable mentally handicapped student.

Materials may be further altered in an additional direction. Given the suggested activities and the quantity of manipulative items involved, it would be conceivable to develop a Career Awareness kit. This would contain several filmstrips and cassettes, an expanded teachers' guide bound in a manner that would allow it to be used while actively teaching, assessment tools, duplicating masters, and any number of games, simulation activities, and manipulatives. Such a kit would serve well in any elementary as well as junior high school curriculum, in addition to meeting the needs of the mentally handicapped population.

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APPENDIX D

Response to Exer-Cor adaptation request

APPENDIX

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Response to EXER-COR Adaptation Request
Roberta M. Felker
11/29/76

After consideration of the potential uses and adaptations for the EXER-COR machine, it is the decision of Specialized Office Three that the machine may not be appropriate for a movement education program for our handicapped populations.

Our decision is based upon a number of considerations:

1. Handicapped students need to be provided with a variety of motor pattern experiences rather than a series of discrete motor skills. For example, the result of asking a student to walk on a balance beam would be the development of competency in that discrete motor skill of walking on a balance beam, which may or may not transfer to the broader movement experience of maintaining balance while walking on the floor. Handicapped students are encouraged to attempt performance of tasks which have maximum transfer to the environment where the student has to perform. Thus a student who needs to learn to crawl would be exposed to those experiences which would facilitate the act of crawling where it would be needed, on the floor rather than on a machine where the student simulated crawling. In other words, the students need to acquire skills which transfer directly to the environment in which they are expected to perform.
2. A machine such as the EXER-COR provides minimal resistance, and therefore is of little use in developing muscle strength.
3. Although the endurance which could be developed in adults through a systematic program involving the EXER-COR machine could also be beneficial for handicapped students, goals for equipment to be used with handicapped students must fulfill criteria in two areas. The first area involves motor experiences which are designed to strengthen muscles, increase flexibility etc., while the second area involves psycho-social

EXER-COR (2)

goals such as success, challenge, and fun. Unless a student is motivated, neither goal is accomplished. Skills need to be taught through pleasurable activities possibly related directly to individual, parallel, or group games rather than in rote situations which demand too much concentration and focus too little attention on the student's enjoyment. The EXER-COR does not provide the high response potential or the emotional involvement necessary to make the activities successful.

4. A major goal of physical education for all students, but particularly those with learning or physical handicaps is the provision of gym or recreational equipment for all students in the class in order to maximize student participation and involvement. The EXER-COR as it exists now is extremely expensive when compared to the cost of homemade innovative play equipment, and would require considerable adaptation (with a probability of increased cost) before it could be appropriate for handicapped populations. The cost of a sufficient number of machines for a class of students is unfeasible.
5. The philosophy of play within physical education as a joyful, free means of communication and expression demands that we, as educators of the handicapped, work to combine the movement experiences themselves with a de-emphasis on "proper" performance standards, and an emphasis on student growth, development and learning in a non-confining (not to be confused with non-structured) program. While fulfilling some needs in terms of phusical fitness and development, the EXER-COR machine does not provide the maximum learning environment for handicapped students.

the
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Research and Development Center
for Cognitive
Learning

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EXER-COR

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APPENDIX E

Adaptation of the I CAN Primary Skills Materials for Use with SEI/Autistic Children, Ages 5-7 Years

FINAL REPORT

Adaptation of the I CAN Primary Skills Materials for Use with SEI/Autistic Children, Ages 5-7 Years

Prime Contract #300-75-0044

Subcontract #024J146

Between

The Board of Regents of the
University of Wisconsin System

and

Michigan State University - Field Service Unit
in Physical Education and Recreation for the Handicapped

Submitted by: Field Service Unit in Physical Education
and Recreation for the Handicapped
Department of Health, Physical Education and
Recreation
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East Lansing, Michigan 48824

August 31, 1977

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I. OBJECTIVES AND NEED

Objectives and Key Performance Tasks

The goal of this project was the establishment of a model for adapting the I CAN Primary Skills physical education materials for use with severely emotionally impaired (SEI)/autistic children, ages 5-7 years. Three principal objectives directed efforts toward the attainment of this goal:

1. To evaluate requirements for adapting the I CAN materials.
2. To revise, review and prepare I CAN materials for a field demonstration.
3. To train participating teachers to implement and evaluate selected I CAN physical education materials.

Several key performance tasks were necessary to implement these objectives. Project activities focused on the development and testing of a strategy for adapting the I CAN materials, with accompanying instrumentation. Major tasks included:

1. Development of an instrument for determining adaptation requirements for each component of the I CAN instructional system (assess, prescribe, teach, evaluate, plan).
2. Selection of I CAN materials for pilot testing.
3. Training teachers to implement the I CAN system.
4. Collection of formative review data from teachers regarding materials revision.
5. Preparation of revised materials for field testing.

Description of the major project tasks and subtasks are detailed in Section II of this report, Approach.

Need

A review of literature reveals that little has been done in the area of teaching motor skills to SEI/autistic children. In the residential centers and institutions where these children are frequently placed, their education has been retarded by the correlated deficiencies approach, which operates on the assumption that only after the child achieves satisfactory personal adjustment will he be able to begin developing functional skills. Since bizarre motor patterns are among the most noticeable and disturbing symptoms of SEI/autistic youngsters, the control or elimination of certain physical activity is often a primary treatment target. Most educational and therapeutic efforts have been hampered by the fact that autism and severe emotional disturbances in children are among the most difficult disabilities to understand and remediate. SEI/autistic children may display any of a variety of marked behavior disorders, such as withdrawal from others, deviant speech and language development, avoidance of human relationships, self-stimulation and/or self-destructiveness, and odd motor patterns. Yet each case is unique; characteristics vary greatly in perseverance and intensity among SEI/autistic children and within the individual child (6, 13).

The etiology of autism and childhood psychosis is an area of uncertainty and controversy. Historically, autism has been viewed as a form of severe emotional disturbance or schizophrenia appearing within the first four or five years of life (3). Many notable therapists, such as Bettelheim (1, 2), considered the child's severe emotional withdrawal and absence of communicative language to be a survival response to an environment which the child perceived to be too harsh to bear. Other early workers, particularly

Kanner (13) and Eisenberg (5), postulated that the direct cause of the child's withdrawal from reality was parental, or at least maternal, rejection of the child. Recently, however, several hypotheses have been formulated which relate autistic behaviors to disorders of the central nervous system (19). One theory suggests that autistic-like behaviors result from a cognitive defect in the language area of the brain which impairs the child's ability to develop and use language properly (24). Another implies that the symptoms result from a deficit in the central nervous system which prevents the child from making cross-modal associations (16). Still a third hypothesis proposes that autism results from a perceptual malfunction which causes the nervous system to improperly regulate sensory input and output, thereby affecting the child's ability to make sense of his environment (18, 19, 20). Other research is exploring the possibility that autism is the result of biochemical imbalances or disorders (4, 16, 23, 24).

There is comparable fragmentation regarding causes and symptoms of the various other disorders commonly classified as childhood psychoses. Childhood schizophrenia is the term generally used to refer to psychotic disorders appearing after age four or five (13). Schizophrenic children often display behavior characteristics similar to those of autistic children, such as bizarre body movement, autostimulation, disturbances in speech and language, impaired interpersonal relationships, and inappropriate emotional displays (14). However, in contrast to the autistic's emotional withdrawal from other people, many schizophrenic youngsters develop extreme attachments to adults and exhibit other significantly different, but still highly variable, behaviors. Causes of schizophrenia in children have often been related to traumatic emotional experiences, usually centering around the child's interactions with parents and family. The fact that many psychotic youngsters come from apparently healthy environments, however, has stimulated exploration into possible neurological and organic bases of childhood psychoses (11, 12, 22, 26). Many psychologists and geneticists assume that the schizophrenic individual inherits some predisposing factor which prevents him from adjusting "normally" to environmental stresses (3).

Due to the uncertainty regarding causes of autism and severe emotional disturbances in children, the bizarre nature of their symptoms, and the extremely variable behavior of many SEI/autistic children, there are also many theories as to the type of treatment that is most effective with these children. Most intervention, however, has focused on ameliorating their behavioral or personality problems; consequently, little research has been conducted relating to instruction on specific skills. Few descriptions of characteristic learning patterns of SEI/autistic children exist. The vast volumes of psychiatric classifications bear little educational significance, since no correlation between the degree of personality maladjustment and the ability to develop specific skills has been established. However, recently some educators have awakened to the feasibility of teaching specific skills to SEI/autistic students, recognizing that not only is it possible to develop skills while simultaneously treating a personality maladjustment, but also that the development of useful skills may in fact contribute to the student's personal adjustment. Impetus for this approach has come primarily from the field of behavior therapy deriving from Skinner's work (27) in learning theory principles and first applied to severely disturbed children by Ferster (7). Behavior therapy, consisting of the presentation or withdrawal of reinforcers contingent upon the child's behavior, has been applied to reduce inappropriate behaviors and to develop useful skills in psychotic and autistic children. The child's behavior is "shaped" by providing positive rewards, sometimes coupled with mild punishment or negative stimuli, for approximations to a target behavior. This approach has proven successful in improving the behavior and social adjustment of many disturbed children.

Studies have shown that structured programs in which skills are directly taught and limits are firmly established provide the most conducive learning environments for autistic children (6, 8). Thus the diagnostic-prescriptive instructional approach has emerged as the most likely means of achieving educational success with SEI/autistic students (8, 9, 15). This approach involves an initial assessment of the student's performance on clearly defined objectives. Instruction then is based upon the student's needs or deficiencies as identified through assessment, and can be sequenced into as many sub-steps as necessary through task analysis. Specific instructional strategies, materials, and reinforcers are determined by the student's learning characteristics. Student performance during and after instruction is analyzed to make the most appropriate judgments about the instructional process (10, 21, 28, 29). Diagnostic-prescriptive instruction is largely an application of behavior therapy techniques to educational tasks, and therefore has found favor among many practitioners attempting to develop educational programs for SEI/autistic youngsters. Yet while the popularity of the diagnostic-prescriptive approach is apparent in the many instructional materials specially designed for several handicapped populations, there is still very little in the way of replicable programs available for the SEI/autistic.

Public Law 94-142 mandates that every student with special learning needs be provided with instruction tailored to meet his individual needs and capabilities. Within the law, priorities have been established for meeting the needs of the most severely impaired students and those currently receiving the least service. SEI/autistic children fall within these priority categories. Many children diagnosed as autistic or severely disturbed have traditionally been placed in institutions with no sound educational programs. However, with the impact of P.L. 94-142 now generating changes throughout the entire educational structure, large numbers of these children are entering the public schools, and institutions are attempting to develop instructional programs for their clients. In either case, SEI/autistic students are entering educational programs without having had systematic instruction in many crucial skill areas, particularly the psychomotor domain. A recent survey of programs for the SEI/autistic in the State of Michigan[1], for example, revealed that while most existing educational programs for these students have adequate physical education facilities and equipment, they do not employ physical education specialists and do not offer any well-planned instruction in physical education. Classroom teachers, most of whom lack any training in teaching motor skills, express concern and frustration that they are unable to contribute to their students' physical development. In the near future, however, these same teachers and their administrators will be charged with providing full educational services for their SEI/autistic students, including appropriate physical education and recreation programs, in order to meet the requirements of P.L. 94-142.

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[1] This survey was conducted by Fran Barger, Jody Smith, and Cindy Montgomery, graduate students in the Severely Emotionally Impaired/Autistic Teacher Training Program at Michigan State University, for the Michigan Department of Education. A written report of the survey results will be available fall 1977 from the Michigan Department of Education.

The potential contributions of physical education to the total development of the SEI/autistic child are clear. Emotional disturbance is often coupled with physical impairment resulting from years of peculiar movement patterns and a lack of instruction in correct motor skill performance. Concomitant health and posture problems frequently result. Physical education can conbribute a great deal to improving the motor patterns of severely disturbed students, as well as enhancing their perception of their own body and its capabilities, their posture, strength, and general health. The opportunity to experience success in completing concrete tasks which physical activity affords may enhance the SEI/autistic student's personal adjustment. In addition, many of these children are characterized by a serious incapacity to relate to other people. Carefully structured physical education may provide a potent but as yet untapped channel for developing awareness of others and encouraging positive peer interactions among SEI/autistic children.

I CAN and SEI/Autistic Students

Rather than attempting to develop a completely new program to meet the immediate and serious need for physical education for SEI/autistic students, it seemed to the staff of this project that research and development efforts should be directed toward identifying quality programs which are already available and determining the most efficient way to make those programs appropriate for severely disturbed students. A number of educators have expressed the belief that the I CAN physical education system and materials can very easily be modified into an excellent physical education program for a variety of learner types, particularly the SEI/autistic.

I CAN is a resource bank of performance objectives, criterion-referenced assessment instruments, sequenced and prescriptive instructional activities, and games in four major content areas of physical education: primary, sport-leisure, social, and associated skills. It has been developed by the Field Service Unit in Physical Education and Recreation for the Handicapped at Michigan State University from 1971 to the present under USOE-BEH funding (OEG-0-73-3905 [608] and contract number 300-75-0122). The goal of the I CAN staff has been to develop a systematic, flexible, adaptable physical education program for trainable mentally impaired (TMI) students. Materials have been field tested extensively in Michigan and proven effective with TMIs, whether taught by classroom teachers or physical education specialists (29). Although I CAN was developed for and validated with TMI students, it contains the elements for individualizing instruction which could make it a very effective teaching system for the SEI/autistic[1]. Many of the existing school programs for these students subscribe to a very structured, behavioral approach to instruction, whether it be directed toward eliminating undesirable behaviors or establishing new ones. Many teachers of SEI/autistic students are accustomed to using task analysis to break skills down into their smallest components in order to find a point at which even the most severely involved student can enter the instructional sequence. However, most classroom teachers and institution personnel do not have the knowledge required to apply task analysis to fundamental motor skills. Therefore they have no idea where to begin to evaluate their students' motor abilities and focus instruction on identified student needs. I CAN is a systematic, behavioral approach to teaching physical education. Basic motor skills are described by well-defined performance objectives which clearly specify student behaviors with the prerequisites, conditions, and standards of performance. This provides the teacher with discrete items for diagnosing motor performance, which then serve to focus prescriptive instruction. Instructional activities and games are designed to accommodate learners at all levels in the skill sequence, and teaching strategies are suggested which are appropriate to a variety of learning styles. Thus it appeared that I CAN would lend itself readily to adaptation for the SEI/autistic and the establishment of a materials adaptation model, the goal of this project.

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[1] See Appendix A for an overview of I CAN.

To summarize, the adaptation of I CAN for the SEI/autistic and development of a materials adaptation strategy were undertaken based upon the following assumptions and expectations:

1. All children are entitled to equal opportunities for self-development to the fullest extent of their individual physical, mental, and emotional abilities.
2. Children with physical, mental, and/or emotional handicaps, who do not have the same ability to adjust and to learn as "normal" children, should be provided with instructional programs specifically designed for their needs and abilities.
3. Physical education can make important contributions to the overall development of all children, particularly the SEI/autistic and other handicapped who have not been afforded opportunities to participate in physical activities.

4. The I CAN physical education program contains the essential elements for individualizing instruction:
    a. Specific behavioral objectives.
    b. Criterion-referenced assessment.
    c. Teacher behaviors for diagnostic-prescriptive instruction.
    d. A variety of learning paths and sequences to accommodate all learners.
    e. Individual, small group, or large group instruction.
    f. Involvement of aides, volunteers, and parents.

5. It is possible to apply the individualized diagnostic-prescriptive approach effectively with any population of learners.

6. A systematic process for evaluating and adapting individualized instructional materials can be developed which will allow for modifying quality materials developed for one population for use with a different population.

7. I CAN provides the means for meeting P.L. 94-142 requirements for individualized education programs (IEPs) in physical education for all handicapped students, namely:
    a. Determination of student's present level of performance.
    b. Specification of short-term instructional objectives and annual goals for each student.
    c. Regular evaluation of student progress.
    d. Recording and reporting devices.

8. Teachers of SEI/autistic students can implement I CAN with relative ease, since their instruction frequently includes student data collection, task analysis of skills, structured behavior management, and a generally systematic instructional approach very similar to I CAN.

II. APPROACH

Context

The project was conducted with teachers and students at the Wayne County Developmental Learning Center, located in Southgate and Redford, Michigan. The center provides day programs for approximately 60 severely emotionally impaired, autistic, and autistic-like students aged 4-22 years in two former elementary school buildings. Classes are generally comprised of one teacher, one aide, and 4-5 students, although older students (15 years and older) are in slightly larger groups. Each school has an elementary-sized gymnasium, with one school having a trampoline and tumbling apparatus, but physical education equipment for the most part consists of tricycles, indoor slides and teeter-totters, some climbing apparatus, and a few balls and mats. No physical education specialist services the center; classroom teachers are responsible for physical education with the assistance of their aides. During the implementation of this project (January-May, 1977), gym time for most classes was scheduled twice a day for an average of 20 minutes per session. Often two or three classes were in the gym simultaneously. Instruction at the center, with the exception of physical education, was based on a structured behavioral approach and was highly individualized. The program administrator, seeking a physical education program, was apprised of the I CAN program by Dr. Ron Wolthuis, Department of Elementary and Special Education, Michigan State University, and subsequently contacted the Field Service Unit in Physical Education and Recreation for the Handicapped to arrange inservice training for all teachers at the center (July, 1976).

The center employs about 25 teachers, all certified in special education for the emotionally impaired. Twenty teachers actively participated in the adaptation project. Of these, ten were teaching the 4-8-year-old students who were the focus of the project.[1] At the onset of the project, all the teachers had been trained to use the Judavine behavior management approach and were consistent in their recording and reinforcement of students' behaviors. All were aware of the particular target behaviors for each student in the school and the techniques being used with each student. Classes were rotated periodically (depending upon the students in the group) so that a given teacher might have an entirely new group of students, for example, every three months. Several teachers switched classes from morning to afternoon also, so that students were exposed to several adults in their school experience.

Plan of Action

The principal objectives of this project were:

1. To evaluate requirements for adapting the I CAN materials for SEI/autistic students.

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[1] Although the project contract specifies 5-7-year-old students, the 4-8-year range better accommodated the center's class groupings and included the 5-7-year range.

2. To revise, review, and prepare I CAN materials for a field demonstration with SEI/autistic students.
3. To train participating teachers to implement and evaluate selected I CAN physical education materials.

In order to achieve these objectives a management plan was devised, which included activities to establish the adaptation model (Phase I) as well as preparation for field testing of the revised materials (Phase II) pending funding of a proposed continuation of the project. Figure 1 below presents the management plan for the project.

Figure 1

Management Product Objective	Management Activities	Evidence of Achievement	Date of Completion Ages 5-7
Implementation of Phase I - Finalization of the Adaptation Model	1.1 Specification of questions for adaptation of each I CAN submanagement system	1.1.1 Development and evaluation of survey instrument	Jan. 1977
		1.1.2 Working paper: items and procedures for administering instrument	Jan. 1977
	1.2 Develop and revise pilot test instruments	1.2.1 Project report: development of pilot test instruments	Feb. 1977
		1.2.2 Final instruments	March 1977
	1.3 Use rating instrument with teachers at pilot site	1.3.1 Project report: tabulation and analysis of pilot teachers' review	March 1977
	1.4 Collect, analyze teacher feedback; make recommendations	1.4.1 List of materials for revision	March 1977

Management Product Objective	Management Activities	Evidence of Achievement	Date of Completion Ages 5-7
	1.5 Prioritize revisions (selections for pilot test)	1.5.1 Revised materials for pilot testing	May 1977
	1.6 Collect formative data, analyze and write recommendations	1.6.1 Project report: Analysis and recommendation for material alteration	June 1977
	1.7 Write and prepare materials for main field test	1.7.1 Materials prepared for main field demonstration	July-Aug. 1977
Prepare for Phase II	2.1 Select sites and teachers for Phase II	2.1.1 Working paper: documentation of sites selected for Phase II	July-Aug. 1977
		2.1.2 Agreement to participate forms filed for each teacher selected	July-Aug. 1977
	2.2 Develop evaluation plan for Phase II (field testing of materials)	2.2.1 Project report: evaluation goals and objectives, information needed to meet objectives, source of information, data collection procedures, analysis to be used	July-Aug. 1977
		2.2.2 Review of the evaluation plan filed	July-Aug. 1977
	2.3 Devise review form for evaluation plan	2.3.1 Working paper: items and procedures for administering review form	July-Aug. 1977
		2.3.2 Review form filed	Aug. 1977
	2.4 Identify data collection forms needed	2.4.1 Working paper: documentation of needed data collection forms	Aug. 1977

Methodology

Since the overall goal of this project was the establishment of a materials adaptation strategy, it was necessary to develop an adaptation model specifying procedural steps and instrumentation for adapting I CAN for a selected population of students. An attempt was made to design the model in such a way that it could guide the adaptation of any instructional program or materials to any type of learner. Preliminary development of the model involved cooperative efforts by staff members of Specialized Office Three, University of Wisconsin-Madison, and the Field Service Unit in Physical Education and Recreation for the Handicapped, Michigan State University, to determine logical and feasible procedures for adapting materials. The procedures were reviewed and revised by two Field Service Unit evaluation specialists, then reviewed by teachers at the pilot center and three teachers involved in adapting I CAN for the New York Institute for the Blind. Further minor revision resulted in the final version of the model. Instrumentation to accompany each procedural step was developed via the same review process.

Three essential evaluative phases for adapting the I CAN materials were identified, each with a specified goal. They are:

Phase I: Pre-Implementation - To select and evaluate an available instructional program for a special population of students.

Phase II: Implementation Planning - To plan for implementation of the selected instructional program by evaluating and modifying segments of the program.

Phase III: Implementation - To determine the effect of the program following implementation with the population of interest.

To attain the goal specified for each evaluative phase, the following steps have been identified as being fundamental:

PROCEDURES

Phase I: Pre-Implementation

Step 1: To determine the appropriateness of the program content by:

1.1 completing Checklist A: Appropriateness.[1]

1.2 analyzing the results obtained from the checklist.

1.3 making a decision to continue the evaluative process for this selected instructional program, or select another program.

Step 2: To determine the feasibility of implementing the program for a given student group and educational setting by:

2.1 completing Checklist B: Feasibility.

2.2 analyzing the results obtained from the checklist.

2.3 making a decision either to continue with Step 3 of the evaluative process, or select another instructional program.

Step 3: To determine the quality of the program by:

3.1 completing Checklist C: Quality.

3.2 analyzing the results obtained from the checklist.

3.3 making a decision either to continue with Phase II of the evaluation, or select another program.

---

[1] See Appendix B for Checklists A, B, and C.

Phase II: Implementation Planning

Step 4: To select instructional objectives from the selected materials which are considered to be of high importance relative to student needs by:

- 4.1 rating objectives as to their priority for particular group of students.[1]
- 4.2 analyzing the results obtained from the rating.
- 4.3 making a final decision relative to which objectives will be included in the program.

Step 5: To examine the objectives selected to determine their usability or modifications that might be needed for the given population by:

- 5.1 completing the Adaptation Questionnaire[2] (as many teachers as possible should complete this questionnaire).
- 5.2 analyzing the results obtained from the questionnaire.
- 5.3 making decisions relative to suggested modifications in the materials.
- 5.4 incorporating needed modifications into materials.

Step 6: To determine the usability of the modified objectives by:

- 6.1 implementing the modified materials with a small number of students or have the modifications reviewed by teachers and/or "experts".

---

[1] See Appendix C for an example rating instrument.

[2] See Appendix D for Adaptation Questionnaire.

6.2 completing the Adaptation Questionnaire.

6.3 analyzing the results obtained from questionnaire.

6.4 making further alterations in the materials.

Phase III: Implementation

Step 7: To determine the extent to which the modified materials are appropriate by:

7.1 implementing the modified materials with a larger sample of students.

7.2 completing the Adaptation Questionnaire.

7.3 analyzing the results obtained from questionnaire.

7.4 making decisions relative to suggested alterations in the materials.

7.5 incorporating further revisions into the materials.

Step 8: To determine the effect of the materials on student performance by:

8.1 collecting student entry level data via Class Performance Score Sheets.

8.2 collecting achievement data via Class Performance Score Sheets.

8.3 analyzing results obtained.

8.4 determining the effectiveness of the materials in producing student performance gains.

8.5 making decisions relative to additional alterations in the materials.

Step 9: To determine the extent to which the program was implemented as intended by:

9.1 monitoring teachers during assessment, prescription, teaching, evaluating, and planning.

9.2 analyzing the results obtained.

9.3 making decisions relative to the degree to which teachers implemented the program as intended.

The following evaluation plan (Fig. 2) displays in matric form specific questions to be answered, the source of information, instrumentation, analysis procedures, and criteria for decision-making for each of the above steps.

Figure 2. I CAN EVALUATION PLAN FOR MATERIALS ADAPTATION

	STEPS	QUESTIONS	SOURCE OF INFORMATION	INSTRUMENTATION	ANALYSIS PROCEDURES	DECISION CRITERIA
PHASE I. Pre-Implementation Awareness and Selection	1	Is the content appropriate for the student population?	Teachers, Administrators	Checklist A: Appropriateness	Count total number of Yes and No responses.	90% Yes responses indicates materials are appropriate.
	2.	Is it feasible to implement the program?	Teachers, Administrators	Checklist B: Feasibility	Count total number of Yes and No responses.	90% of Yes responses indicates the program is feasible.
	3.	Is the program of sufficient quality	Teachers, Administrators	Checklist C: Quality	Count total number of Yes and No responses.	90% Yes responses indicates high quality program.
PHASE II. Implementation Planning	4.	Which objectives are of high priority?	Teachers	Teacher's Rating	Count the number of "H's" and "I's" for each performance objective. (H = highest priority; I = important)	Any objectives rated "H" by majority of teachers should be selected.
	5.	How usable are the objectives that have been selected to be of high importance?	Teachers	Adaptation Questionnaire	Calculate the percent of response for each item included on the checklist. Compile written suggestions along with rationale.	Make alterations in materials when recommended alterations are feasible and appropriate in view of rationale.
	6.	How usable are the modified objectives following pilot test or interviewing technique?	Teachers and/or "experts"	Adaptation Questionnaire	Calculate the percent of responses for each item included on the checklist. Compile written suggestions along with rationale.	Make alterations in materials when recommended alterations are feasible and appropriate in view of rationale.

PHASE III. Implementation

STEPS	QUESTIONS	SOURCE OF INFORMATION	INSTRUMENTATION	ANALYSIS PROCEDURES	DECISION CRITERIA
7	Are the materials appropriate?	Teachers	Adaptation Questionnaire	Same as 5 and 6 above.	Same as 5 and 6 above.
8.	Was there a significant change in student performance?	Students	Individual Record, Class Performance Score Sheets	Subtract post-test scores from pre-test scores. Calculate the percent of students who met the performance criteria.	Decision criteria to be determined by decision-makers based on characteristics of the student population.
9.	Was the program implemented as intended?	Teachers, Consultants	Monitor Forms for: Assessment Prescription Teaching Evaluating Planning Yearly Program Plan Monthly Plans Daily Lessons	Calculate the extent to which each teacher implemented the program as intended.	Any teacher who did not implement the program within a 90% level of what was intended should be eliminated from the analysis.

This project was based on an a priori assumption that Phase I of the evaluation plan had already been completed relative to adaptation of I CAN for the SEI/autistic; that is, I CAN was determined to be generally appropriate, feasible and of sufficient quality to be implemented with this student population, for reasons developed in Section I of this report. Therefore the objectives for this project focused primarily on Phase II (Implementation Planning) activities. Methodology for each project objective is described below.

Objective One: To evaluate requirements for adapting the I CAN materials.

Information needed: In order to identify which aspects of I CAN might require modifications, it was necessary to systematically examine each component of the I CAN teaching system and materials relative to the instructional needs of the population of interest. Where a potential deficiency, deletion, or change was identified, it was also necessary to obtain suggested alternatives and rationale to support the suggested change.

Source(s) of information: Teachers at the pilot center, who were trained in implementing I CAN and also considered experts in teaching SEI/autistic children, provided information regarding alterations in the materials.

Data collection procedures: An Adaptation Questionnaire was developed to obtain modification information. This form was designed for systematic review of each segment of the I CAN materials and the I CAN Implementation Guide as they are used to implement each component of the diagnostic-prescriptive teaching process: assessment, prescription, teaching, evaluation, and planning. The reviewer is directed to consider each aspect of the materials as to its appropriateness for his/her particular students, and to indicate whether that aspect is appropriate as it exists; would be appropriate if modified; or is inappropriate. Responses in the "modify" or "inappropriate" category are to be supported with a suggestion for alternatives and a rationale for the response.

Ten pilot teachers of 4-8-year-old SEI/autistic students were each asked to complete the questionnaire relative to instructional materials for two selected I CAN performance objectives and the Implementation Guide. The teachers had all used at least one I CAN performance objective, but need not have taught the ones they were asked to review. Since five performance objectives were selected for pilot test revision, reviews were assigned to the ten teachers such that four reviews of each of the five objectives were solicited. In addition to this structured review, a good deal of information was obtained through teachers' conversations with the three I CAN staff consultants during regular visits to the pilot center.

Analysis: Completed Adaptation Questionnaires were collected from the ten teachers. A summary was made for each performance objective by tallying the number of responses in each category for each question and recording all written comments, suggestions, and rationale.

Decision criteria: Adaptation Questionnaire summaries were reviewed by the three I CAN staff consultants who participated in training and support visits to the pilot teachers, and one I CAN evaluation specialist. Due to the small number of teachers evaluating each performance objective, one response in the "modify" or "inappropriate" category on any question was sufficient to warrant close examination of the identified component of the materials. Revision recommendations were accepted based on the strength of the rationale supporting the suggestion and the feasibility of implemeting the change, as judged by the four project staff experts.

Objective Two: To revise, review, and prepare I CAN materials for a field demonstration with SEI/autistic students.

Information needed: The I CAN Primary Skills include instructional materials for 78 performance objectives in four areas: Fundamental Skills, Body Management, Health/Fitness, and Aquatics. Since it was not feasible to revise all of these materials due to the time and staff limitations of this project, it was necessary to determine which materials should be revised for pilot testing. The recommendations from Objective One would then supply the information needed to revise the selected sample materials as well as the I CAN Implementation Guide.

Source(s) of information: Teachers at the pilot center provided information for selecting materials. The summaries of their feedback regarding the selected materials (completed Adaptation Questionnaires) were the primary source of information for making revisions. The project staff provided further information based upon their literature review, interactions with pilot teachers, and observations of teachers and students at the pilot center.

Data collection procedures: Feedback regarding priority I CAN objectives was obtained by the I CAN trainer from pilot teachers during the two-day inservice workshop at the pilot center, conducted prior to initiation of this project.

At that time, teachers indicated that the areas of Fundamental Skills and Body Management[1] were most important for their 4-8-year-old students. This was reconfirmed in a meeting with the teachers at the onset of the project. An instrument was then devised which simply listed all the performance objectives included in these two areas, which teachers were asked to rate according to importance for their particular group of students, using the following scale:

1 - Highest priority; must be included in the physical education program
2 - Important; should be included if time is available
3 - Unnecessary or irrelevant[2]

Once materials were selected, revision suggestions were compiled via completed Adaptation Questionnaires as described for Objective One. In addition, final recommendations for revisions were reviewed by pilot teachers and project staff.

Analysis: Teacher priority ratings were tabulated according to the number of 1, 2, and 3 ratings received by each performance objective to determine materials for pilot revision. Once materials were selected, teacher feedback was collected and analyzed as described for Objective One. Review of the final revision recommendations by teachers and project staff yielded no further changes.

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[1] See Appendix A for the content included in each I CAN skill area.

[2] See Appendix C for the rating instrument used.

Decision criteria: The two I CAN skill areas selected by the pilot teachers, Fundamental Skills and Body Management, are further divided into two skill groupings each: Object Control and Locomotor Skills; and Body Awareness and Body Control. The project staff decided that materials selected for pilot test revision should be representative of these four areas. In tabulating the teachers' priority ratings, the performance objectives receiving the most "highest priority" (i.e., 1) ratings would be selected; in case of a tie, the number of "important" (i.e., 2) ratings would be considered.

Applying the decision criteria from Objective One for materials revisions, the project staff determined that the majority of the changes recommended for the selected materials were applicable to the remaining Fundamental Skills and Body Management materials. Therefore, rather than rewrite entire portions of I CAN, it was decided that for pilot and field test purposes the recommended modifications would be produced in the form of supplements to existing I CAN materials, which would follow the format of the materials with modifications for the SEI/autistic population noted under the appropriate headings. For a further description of the materials revisions, see Section III of this report, Results.

Objective Three: To train participating teachers to implement and evaluate selected I CAN physical education materials.

Information needed: Over several years of inservice training experience, the Field Service Unit staff has developed and refined a model for inservice training and follow-up services. A Leadership Manual has also been developed to guide trainers in conducting inservice workshops. While thousands of teachers around the country working with a variety of handicaps have participated in I CAN training, the model had not been used with a group of teachers of SEI/autistic students. Therefore the project staff was interested in knowing whether the training format could be effective with teachers at the pilot center.

Source(s) of information: Teachers participating in the training and implementation of I CAN were the source of information regarding the training procedures. Project staff conducting the training also provided their impressions.

Data collection procedures: An initial two-day inservice workshop was conducted for all teachers at the pilot center, at the request of the center administrator. On completion of the training the teachers were asked to evaluate the workshop content, the trainer, and the potential usability of I CAN with their students. A summary of their responses is found in Appendix E. At the onset of the implementation of this project, procedures and responsibilities were outlined verbally to the teachers and administrator. All teachers making a commitment to try I CAN with their students were asked to sign a Participation Agreement detailing responsibilities of all involved, which is attached as Appendix F. Upon completion of the teachers' portion of the project, which included using at least one I CAN performance objective, evaluating materials for their appropriateness to SEI/autistic students, and interacting with an I CAN consultant on regular visits, the teachers were asked to express any concerns or problems with the training model.

Analysis and decision criteria: No formal analysis was applied to this objective. The teachers' written reactions to the initial training were summarized. Those teachers who were willing to make a commitment by signing a Participation Agreement, completed feedback forms conscientiously, made an effort to try the materials, actively sought the assistance of the I CAN consultant, and were judged by the consultants to be implementing I CAN as intended, would be included in the pilot test and/or field test of the modified materials.

III. RESULTS

Objective One: To evaluate requirements for adapting the I CAN materials.

Objective Two: To revise, review, and prepare I CAN materials for a field demonstration with SEI/autistic students.

Since Objectives One and Two are very closely related and much of the information obtained during the project pertains to both, the results of these two objectives taken together will be summarized below.

1. Five I CAN performance objectives met the criteria for pilot revision selection for 4-8-year-old SEI/autistic students (i.e., most "high priority" teacher ratings and representative of Fundamental Skills and Body Management materials). They were: run, catch, body parts, body actions, bounce on trampoline.

2. Revisions in I CAN materials should be made in the form of modification sheets to accompany existing I CAN Primary Skills wherever possible. Modifications which apply to the I CAN teaching system and to the instructional materials in general include:

    a. These students do not function in group activities; they require almost constant one-to-one supervision. Therefore, the organizations written for the existing I CAN Assessing Activities, Instructional Activities, and Games for groups of up to 15 students must be modified for use with the much smaller adult-student ratio of the autistic classroom (1:2).

    b. The "scatter" organization suggested for some I CAN activities is inappropriate. Students need structure (i.e., concrete physical and environmental cues) and direct supervision.

    c. Standards of student performance (e.g., 2/3 times, 80%) in some objectives, and the skill levels themselves, may be too high for young and low-functioning SEI/autistic students. The teacher should teach and reassess the objective with as many students as possible, task-analyze the skill, then make realistic adjustments in the performance levels.

    d. Young SEI/autistic students appear to require more instructional time to achieve one focal point on a performance objective than the time guidelines given in the I CAN Implementation Guide for TMI students (i.e., 180 min. for Fundamental Skills and Health/Fitness; 120 min. for Body Management).

e. There is a need for game activities in which SEI/autistic students can be taught motor skills, interpersonal awareness, and the basic concept of play, all of which are seriously lacking in these students. To be effective with young SEI/autistic students, games need to be highly structured so that they can be conducted with one adult directing the child initially, then gradually lead into partner play and small group activity. Many of the I CAN games, though written as group activities, lend themselves readily to this sort of restructuring.

f. Performance fluctuates a great deal among these students; therefore, reassessment needs to be done frequently, perhaps daily in some cases. This would necessitate a change in the I CAN recording instruments to provide more detailed assessment information on each child, possibly a combination of the Class Performance Score Sheet and Individual Record of Progress.

3. In addition to the above alterations in materials, general recommendations regarding teaching I CAN to SEI/autistic students should take the form of a supplement to the existing I CAN Implementation Guide. These include:

a. Many young students do not imitate and require much physical manipulation. In applying teaching strategies from the Instructional Activities ("What to Do"), teachers should pay close attention to the suggestions for physical and environmental manipulations, while still being prepared to model for the occasional student who imitates.

b. SEI/autistic children learn best in an environment of limited stimulation. Distractions, such as extraneous people and objects, should be removed from the physical education setting. Students in small groups should be organized in the least distracting part of the gym or activity room, such as in a corner near a wall, or in a partitioned area. (Mats or portable screens should be used to partition off an area of a large room.)

c. Reinforcements, positive or negative, that are being used with the student in other learning settings should be carried over and consistently applied in physical education.

d. Many SEI/autistic students respond negatively to even slight changes in their environment or daily routine. New skills, concepts, and strategies in physical education should be introduced gradually, especially since these students may never have received instruction in motor skills previously.

e. Aides should be utilized to the fullest extent in physical education, since these students require a great deal of one-to-one supervision and manipulation.

f. Instruction in physical education should be coupled as much as possible with other learnings, especially language, to increase the student's ability to generalize instruction and to contribute to the essential need for repetition of instruction.

g. Many students enjoy certain gross motor activities which may or may not include skill instruction, such as riding scooter boards or tricycles, bouncing on a trampoline, etc. Students' attention and on-task time may be increased by using enjoyable activity as a reward for attending to skill instruction.

h. SEI/autistic children tend to make specific associations between words and concepts and therefore do not readily transfer learning from one situation to another. Use of the I CAN Action Words, which are specific verbal cues to accompany physical and environmental teaching strategies, can enhance the student's learning of concepts that are common to many different skills.

i. Repetition of instruction is essential to the learning of SEI/autistic students. Daily lessons and long-range plans should provide ample time for repetition and practice of motor skill learning. At the same time, lessons should be as rewarding and motivating as possible to prevent boredom on the part of students and teacher.

Many of these recommendations have been incorporated into several games for the five performance objectives selected for this project. Examples may be found in Appendix G. However, due to an inordinately severe winter which impeded I CAN consultants' travel to the pilot centers, and illnesses among three key teachers of 4-8-year-old students at the pilot center, the revised materials were not implemented in a pilot test with students. They were reviewed by a majority of the participating teachers in an end-of-year meeting with the project staff, all of whom agreed that the modifications were reasonable and accurate. The teachers had no further recommendations at that point. The recommended revisions should, however, be considered only recommendations until the revised materials are implemented and student performance data is obtained to determine their effectiveness with SEI/autistic students. Neither can the model for adapting materials be considered valid until it is determined through a pilot test of the revised materials that the model in fact produces materials which are effective with the student population of interest.

Objective Three: To train participating teachers to implement and evaluate selected I CAN physical education materials.

1. The summary of teachers' reactions to the initial two-day inservice workshop (Appendix E) indicated that the teachers as a group were generally very positive about the workshop content, presentation, and the potential for using I CAN with their SEI/autistic students.

2. At the onset of project implementation, 19 teachers actually signed written commitments to participate in the project. Three teachers who

did not return signed agreements, however, actively used the materials, interacted with the consultant, and returned evaluation forms on request.

3. Of the 10 teachers of 4-8-year-old students who were asked to complete Adaptation Questionnaires evaluating two performance objectives each, seven teachers returned both forms completely and correctly. One teacher completed only one questionnaire, and two teachers did not return the forms.

4. During the 18-week period of the project, from January 10 to May 13, 1977, I CAN consultants visited each pilot school 10 times, initially once a week for six weeks and then once every two to three weeks. The consultant attempted to see each teacher using I CAN with his/her students on every visit, answering questions regarding the program, gathering feedback, actively assisting or demonstrating for the teacher methods of assessing and teaching students, and developing long-term or daily instructional plans with the teacher.

5. All participating teachers were provided with I CAN Implementation Guides for their own use. Each teacher was given at least one sample materials packet to implement at the beginning of the project. By the end of the project each school had also obtained all four I CAN units (Fundamental Skills, Body Management, Health and Fitness, Aquatics) centrally located as resources for all teachers.

6. Of the 22 teachers who indicated they would participate in the project, all but two made considerable efforts to implement the program as

intended, to seek the assistance of the I CAN consultant, and to provide evaluative feedback on request.

Problems/Limitations

Several contextual variables could be considered limitations to the completion of this project and interpretation of the results:

1. Due to the severity of the 1977 winter, during which time visits to the pilot center were scheduled, consultants from the field service unit could not make all the planned 180-mile round trip visits to the pilot center. As a result, the training of the pilot teachers and collection of their materials review forms were delayed.

2. The student population at the pilot center increased; there were also several new teachers hired who had not participated in the initial training program. Thus teacher assignments were not completely settled at the onset of the project, and new teachers had to be trained during site visits by the consultant.

3. Three teachers of 4-8-year-old students at the pilot center, all of whom had been asked to complete Adaptation Questionnaires on two performance objectives each, became ill and did not complete questionnaires until as much as three weeks after the deadline. This delayed the analysis of the teachers' feedback, and thus the materials revision, considerably. As a result, the feedback summary, generation of recommendations for revisions, and actual revision of materials could not be completed within the timelines set out in the project plan.

4. During visits to the pilot center, the I CAN consultant attempted to see up to 15 or more teachers in one day. Since the I CAN consulting model involves interacting directly with teachers and students in the gym, then discussing problems or questions with each teacher, the consultants had in the past visited only one or two teachers per site visit. It was extremely difficult, even impossible at times, to adequately deal with each of 15 teachers' concerns in one day.
5. Scheduling of physical education time at one of the pilot schools required that often two groups of students and teachers were in the gym at the same time. The noise level sometimes produced, coupled with the students' distractability and need for one-to-one supervision, cut into the quality and quantity of instructional time available in the gym. At the other pilot school, SEI/autistic classes divided gym time with TMI, physically handicapped, and other classes such that it was difficult to schedule adequate physical education time for the SEI/autistic students, particularly on the days when the I CAN consultant could visit.

Unanticipated Results

In addition to the results described above, several other significant events resulted directly or indirectly from this project:

1. The Field Service Unit in Physical Education and Recreation for the Handicapped at Michigan State is being recommended as a resource for inservice training and consultation regarding physical education programs for the SEI/autistic in the State of Michigan (see Appendix H).

2. This project provided the basis for a proposal for a wide-scale study under USOE-BEH Handicapped Media Services and Captioned Films funding, entitled "Project I CAN: Instructional Materials Adaptation and Mediated Training Program" (submitted July 22, 1977). An abstract of the proposal may be found in Appendix I.

3. The Wayne County (Mich.) Intermediate School District, having learned of I CAN through the administrator at the pilot center for this project, contracted with the Field Service Unit to train teachers in all 18 Wayne County trainable centers in the implementation of I CAN.

4. The adaptation process developed for this project will be applied to adapting I CAN for the visually impaired at the New York Institute for the Blind during the 1977-78 school year.

5. This project served as a starting point for two graduate projects by students in physical education for the handicapped at Michigan State University.

Recommendations for Future Actions

1. Future investigations using I CAN with SEI/autistic students should focus on obtaining student performance data to determine the effectiveness of I CAN with these students.

2. There are notable differences between young SEI/autistic students and older age groups, i.e., over 14 years. The adaptation process needs to be applied to the older groups in order to develop viable instructional alternatives using I CAN with them.

3. Since instructional programs are just being developed for the SEI/autistic in many areas, and physical education is an area of serious need, further adaptation and refinement of I CAN for that population should be pursued.

4. No data is available on the functional motor skkll performance of SEI/autistic students. I CAN provides the tools for gathering such data for: 1) developing local norms for determining general expectancies of motor performance for SEI/autistic students at various developmental levels; and 2) setting annual goals and short-term objectives for each student's individualized education program (IEP).

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APPENDIX F

Development of a Prototype Eye Teaching System with Communication Aides for Non-Vocal Severely Handicapped Children

DEVELOPMENT OF A PROTOTYPE EYE TRACKING SYSTEM FOR USE WITH COMMUNICATION AIDS FOR NON-VOCAL SEVERELY HANDICAPPED CHILDREN

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I. INTRODUCTION

Communication for the non-vocal severely handicapped child can be a very difficult and frustrating experience both for the child and those trying to communicate with him. Depending on the degree of motor involvement, such children are often limited to communicating through a form of "charades" where a second person interprets yes/no responses from the child through head, hand or eye motions. Communication for these individuals may be greatly improved through the use of communication techniques and aids being developed at centers around the world. Many severely involved children, however, are unable to use many of the more effective communication aids because they lack certain necessary motor skills. As a result, they are forced to communicate at a rate which is far below their potential.

One solution to the communication problem for these severely involved children utilizes the child's eyes to "point" to communicate. Since many non-vocal severely handicapped (NVSH) children do retain control of voluntary eye motion, this approach has shown great promise for providing a more rapid and effective communication channel for these children.

Presently there are two basic types of communication aids which are being used to provide communication through eye movements. The first type consists of a chart with a number of responses arranged in such a way that the child can indicate an individual response to a second person through indication with his eyes. These chart type aids, such as the ETRAN (see Reference), do provide fairly good communication, but they rely on the presence of a second person who knows the system. Without the presence of a person familiar with the system, the child is unable to communicate.

A second type of aid which is applicable to eye communication utilizes a display which sequentially scans a display of responses. When the desired response is reached, the child operates a switch, causing the chosen letter or word to be printed. A child may use a simple on-off switch activated by eye movements to operate this scanning type of aid. Since only very simple eye movements are required in this approach, many severely handicapped children can use this technique effectively. A great disadvantage of the scanning approach, however, is its inherently slow speed. A cerebral palsied child who was able to use a scanning aid extremely well could only make about one selection every five seconds. Thus, if he were spelling a message, he could print only about two words a minute, a speed which is very slow.

II. PURPOSE OF RESEARCH PROGRAM

The purpose of this project was to explore a new type of communication aid which would allow NVSH children to use eye movements to "talk" rapidly and independently. This type of communication aid would utilize a device which could automatically monitor the child's eye position in much the same manner as a second person monitors eye position when a chart type of aid is employed. Using this position sensor, the communication aid could then interpret the child's indicated response and cause it to be printed on a standard output device, such as a printer or TV screen display. This type of communication aid could thus provide more rapid and independent communication than could be achieved by the scanning or standard chart approaches.

This new approach would consist of four functional blocks: an eye position monitoring device (transducer), a selection display, a processor, and an output device. As the child looks at his chosen response on the selection display, the transducer picks up his eye position. This position information is then fed into the processor, and the response associated with that eye position is determined. The response is then output on a display (such as a TV screen) so the child can see what he is "saying" and so that others may read the message.

Three of these functional blocks, the selection display, processor, and output, can be implemented utilizing readily available technology. Selection displays and processors have been developed for use in other types of communication aids, such as scanning type aids, and several kinds of output devices such as TV screen displays or special typewriters are commercially available as standard output forms. The fourth block, however, the eye position transducer, has not previously been developed in a form which is appropriate for use in communication aids. The focus of this project, therefore, was on exploration and development of an eye position sensing system for use in eye controlled communication aids.

III. DEFINITION OF THE PROBLEM

It was determined that an eye controlled communication aid would have to meet certain criteria to provide an effective means of communication in the various environments in which it would be used. The most important of these were:

(1) The aid should provide a reasonably rapid means of communication.

(2) The aid should allow the child to communicate independently at any time he chose to activate the aid. This would allow the child to initiate communication himself and promote more spontaneous expression.

(3) The aid should be flexible enough so that it could be applied to a variety of individuals in different types of environments.

(4) The aid should restrict the child's vision and head movements as little as possible.

(5) The aid should be unobtrusive and cosmetic, allowing the child using it to look and behave as much like his peers as possible.

(6) The aid should be rugged and it should be portable so that the child could be moved from one place to another without losing his ability to communicate. This is especially important in the educational environment, where the child should be able to move about freely to provide better interaction with teachers and other children.

(7) The aid should be designed to be available in its final form at a reasonable cost.

Preliminary Research

With these criteria in mind, a literature search was carried out to determine how well any existing eye position monitoring systems would function as part of an eye communication aid. This search also included conferences with other researchers working on development or evaluation of eye position monitoring systems.

Most existing eye position sensors identified were developed for medical or psychological studies of eye movements. These devices were usually very bulky, very expensive, difficult to use, and would require the child's head to be restrained during use. One such system, at the Langly Research Center (see Reference), has been adapted as a communication aid, but since a computer is required to do the monitoring, the system is prohibitively large and expensive. In the end, it was determined from this study that no existing eye position monitoring system fit the criteria stated above. As a result, a new monitoring technique was sought out.

IV. DEVELOPMENT OF A PROTOTYPE EYE POSITION SENSING SYSTEM

Several methods were considered for monitoring eye position, including techniques using electrodes, special contact lenses with built-in position indicators, miniature TV cameras focused on the eyes, and optical systems using light reflected from the eye. Of these systems, it was determined that optical systems would provide the best means of monitoring eye position for the following reasons:

(1) This method does not require the attachment of electrodes, etc. to the child.

(2) Such a device has the potential of being made very compact and unobtrusive.

(3) It would be safer to use with children.

(4) It would be more convenient to use, requiring less time to set up and adjust for the child.

(5) It could be built so that it would not impair the child's vision.

Before development of an optical transducer system was begun, studies were carried out to determine what kinds of eye movements would have to be interpreted. One of the problems encountered in monitoring eye movements is that of separating actual eye movements from eye movements due to a change in head position while the eye is fixated on an object. If the child is looking at a response on a display, for instance, his eyes may be fixed on the display but will move with reference to his head if his head moves. Therefore, the optical monitoring system must be able to provide enough information about eye movement so that changes in eye position due to head movement may be distinguished from direct voluntary eye movements. Studies have shown that it would be possible to make this distinction using the information provided by an optical monitoring device, but this would result in a more complex and expensive processor system.

One method which can be used to solve the problem of having to separate head movements from eye movements is to use a selection display which is referenced to the child's head and thus moves with his head. This could be achieved by using tiny points of light out of the normal line of vision as the targets for the selection display. In this manner, the child could see it when he wished, but it would not interfere with his normal vision. This method was chosen for development in the initial prototype because it allows the eye controlled communication aid to be more portable, more flexible, and less expensive.

Description of the Eye Position Monitoring System

The eye position transducer developed under this program utilizes a new technique of optically monitoring the eye's position An array of light sensitive detectors mounted on spectacle frames is directed toward the eye, with each sensor monitoring reflected light from a very small portion of the eye's surface. Since the iris and pupil of the eye are much darker (and therefore reflect less light), the array of light detectors can be used to determine the location of the iris and pupil, by determining where the dark portion of the eye is located. Using this information, the center of the eye can be determined by computing the location of the center of the dark portion. By using a large number of light sensitive detectors in the array, this transducer can detect eye position with enough accuracy to operate a communication aid.

This eye position monitoring system can be made very compact and unobtrusive, allowing good vision and unrestrained head movement for the child using it. The miniature eye position transducer, when coupled with a miniature processor, selection display, and an output device, would result in a communication aid which could meet the criteria for an effective eye controlled communication aid (see Fig. 1).

In the present laboratory prototype system (see Fig. 2), information from the array of light sensors is fed into a computer which has been programmed to simulate the functions of the processor and the output device. In this manner, an eye controlled communication device can be realized and evaluated without the need for time-consuming design of special electronics. The computer program determines the position of the center of the eye, displays this measured position and stores the information so that comparison studies may be done to determine the accuracy of the system.

This computer simulated system can also be used to evaluate the eye controlled communication aid with a NVSH child before a communication aid is actually constructed. This method allows any necessary functional changes to be made using the more flexible computer programmed system before a prototype communication aid is designed.

V. SUMMARY

The prototype eye position monitoring system has been developed and is currently under evaluation to determine accuracy of eye position measurement and operation with different individuals under various environmental conditions. In addition, studies are being conducted to determine the feasibility of developing a system which can separate head movements from eye movements. This evaluation is being carried out using the facilities of the Data Acquisition and Simulation Laboratory at the University of Wisconsin-Madison.

The prototype system has been used to successfully measure eye position with a resolution of eight positions with different individuals and under a variety of lighting conditions. The system resolution will next be increased to sixteen and these tests will be repeated. The prototype system will then be tested as a simulated communication aid with handicapped individuals to evaluate communication speed and accuracy.

Future efforts will include miniaturization of the eye position transducer, design of a miniature control processor, and field testing of the approach.

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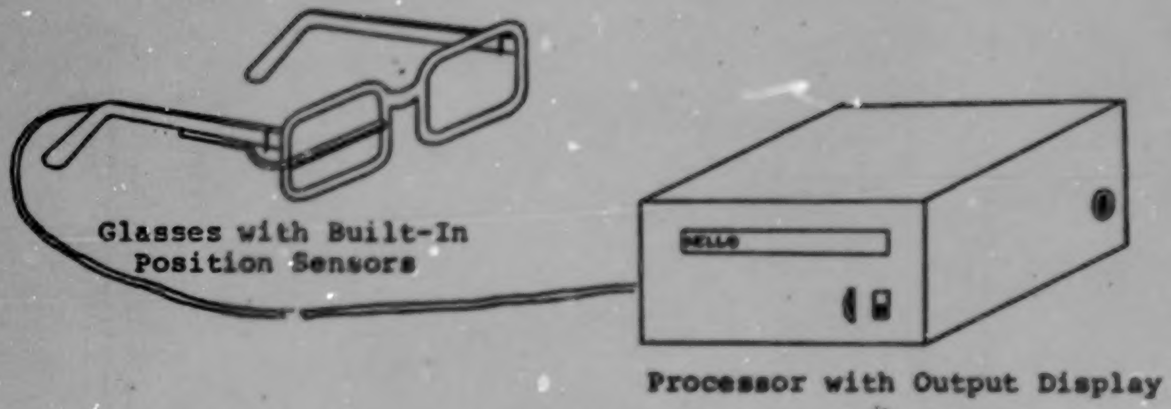
HELLO
Glasses with Built-In Position Sensors
Processor with Output Display

FIGURE 1. Miniaturized Eye Controlled Communication Aid.

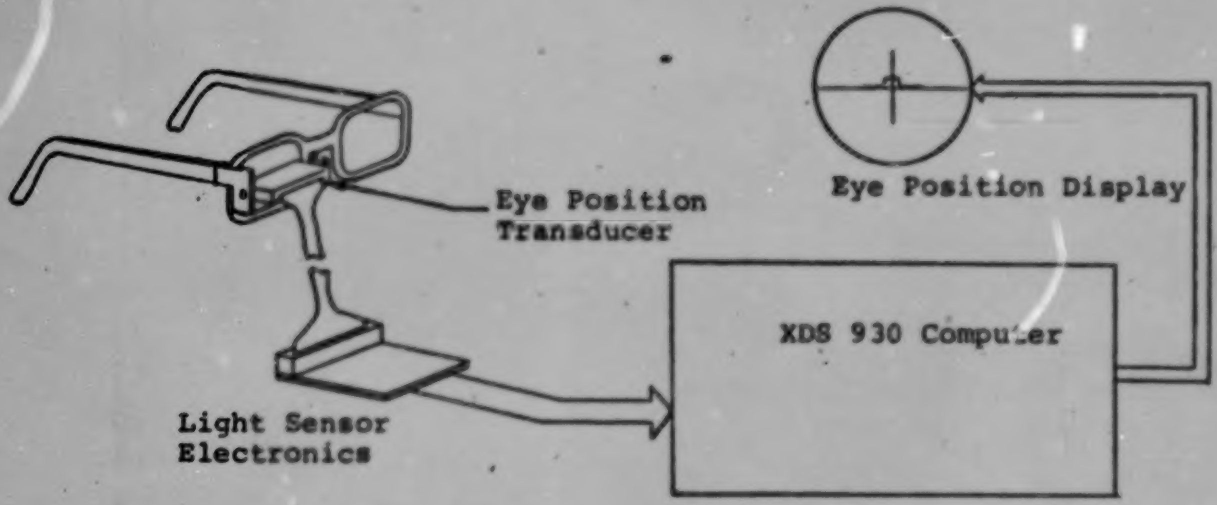
Eye Position Transducer
Eye Position Display
XDS 930 Computer
Light Sensor Electronics

FIGURE 2. Present Laboratory Prototype System.

Appendix VI

AUTO-COM FIELD TEST: FINAL REPORT

ACKNOWLEDGEMENTS

This field test has been made possible through a subcontract from Specialized Office #3 of the Area Learning Resource Center Network (ALRC-BEH-OE) and through DHEW-OE Bureau of Education for the Handicapped Grant #OEG-0-74-7461.

OUTLINE

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   B. Rationale for Evaluation of Communication Aids

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      2. Review of Past Programs

   C. Background Information -- Overview of Pilot Evaluation of the First Stationary Auto-Com

   D. A Field Test of the Portable Auto-Com -- Goals and Objectives

II. METHODS AND PROCEDURES

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   B. Students

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III. RESULTS -- DISCUSSION OF FIELD CENTER REPORTS

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V. SUMMARY

VI. REFERENCES

I. INTRODUCTION

A. Statement of the Problem

It is encouraging to note that, with the passage of recent federal and state legislation, severely handicapped children who have heretofore been excluded from most educational opportunities now have been given the right to enter into public school educational programs. A major concern among parents, educators and clinicians involves the school system's ability to appropriately meet the special educational needs of these children. Specifically, the concern involves educators' and clinicians' preparation to design effective educational programs which will provide these children with meaningful education which they deserve.

One of the most difficult populations to include in public school programming will be non-vocal severely motorically impaired children. These children are unable to communicate, except through gross gestures and pointing, or effectively interact and transport themselves in their environment without the support of a variety of assistive aids. Although their physical disabilities and need for various therapies may preclude them from complete mainstreaming into regular educational classes, it is their communicative deficit which will (and has) preclude them from effective and meaningful interaction in almost any instructional/learning environment.

These children, unable to speak and, in some cases, unable to gesture or point due to severe motor involvement require extensive one-to-one instruction and are very dependent upon others to interpret their needs and wants.

Their inability to respond in an effective and consistent way to their environment, along with their inability to take tests, perform manipulative tasks, respond to questions or conversations of others, initiate questions and conversation, or express emotions has, in the past, relegated them to a role of relatively passive observance in the classroom. Experiential and interactional deficits have severely limited their learning and educational progress and concomitant physical and communicative deficits have precluded accurate assessment of residual skills and learning which may have occurred.

Educators are now faced with the task of developing appropriate educational programs for these children. Most of the children who have been enrolled in educational programs previously will come to the classroom labeled "severely mentally handicapped"; for others, enrollment may be their first educational experience, and chronological age for these latter children may well range between 3-21 years. It will be the educator's and clinician's task to meet the educational and communicative needs of these children; but in order to accomplish this, they must be fully prepared to design and develop effective programs.

Although the educational needs and deficits of the NVPH child will be myriad, the deficit which must be remediated prior to all others is communication. In order for any educational program to provide a meaningful experience for the child, he must be provided with some means of communicating his needs, thoughts, and ideas to others. The only accurate way of assessing the child's ability to learn, or of assessing his basic skill abilities and deficits, is through communication. The child must be able to consistently and effectively respond to others and communicate his knowledge.

B. Rationale for Evaluation of Communication Aids

1. Overview of Rationale

Currently, there are many different communication aids and techniques which can overcome severe communication deficits in non-vocal motorically impaired children (Vanderheiden, Harris-Vanderheiden, 1975). These aids and techniques range from fundamental classroom constructed letter and wordboards to more advanced electronic portable aids. Although many of the aids are similar in concept or on operation, each is designed a little differently, with certain necessary skills for operation.

Just as there is a great diversity in the number and type of physical and communicative deficits which NVPH children may have, there is a great diversity in the type of communication aids available and the functions which they can serve for different children. These aids and techniques, when appropriately applied and integrated into educational programs, can overcome the severe communication deficits of a great number of NVPH children. It is of critical importance then that educators and clinicians learn of these aids and become familiar with how and when to utilize them. They must be provided with information concerning the specific characteristics of each aid; the aid's population applicability; its use and value in the educational and communication skill progress of the NVPH child; its effect upon the child's socio-emotional adjustment; teacher, parent and child reaction to use of the aid; and basic cost/benefit information on the aid.[1]

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[1] Since many of the aids will be relatively expensive, the educator needs to become aware of those benefits which the aid will provide the child which cannot be attained through other methods.

2. Review of Past Programs

The only known systematic evaluative efforts to date have been those conducted by the Cybernetics Research Institute (Kafafian, 1973), the Crotched Mountain Foundation (1966), Tufts Biomedical Engineering Center (in progress), and the one described in this report.

The Crotched Mountain study was addressed to an evaluation of "the ability of cerebral palsied persons to manipulate and control a series of switches connected to various output devices" (1966). Success in the program was measured by the individual's ability to control one or more of a series of outputs through utilization of an appropriate switch. Cybernetics Research Institute (CRI) included more observation of the use of communication aids for various classroom activities, but major focus was placed upon determining whether or not providing the children with a prosthetic aid allowed them to achieve a "usable and effective written communication capability" (Kafafian, 1973). Neither of these studies addressed itself toward assessing the educational and communication impact of providing an NVPH child with an effective means of communication. This aspect has been included in the Tufts study (Foulds, 1975) and is the primary focus of the field evaluation reported here.

C. Overview of Pilot Evaluation of the First Stationary Auto-Com

In 1973, the Cerebral Palsy Communication Group initiated a preliminary evaluation program, designed to field test the stationary Auto-Com. (See Section II.A. for picture and description of the aid.) The purpose of this program was to evaluate the stationary Auto-Com as an aid to the education and communication of the non-vocal, motorically impaired child. Nine non-vocal cerebral palsied children were selected to participate in this study and seven orthopedic classrooms in Wisconsin and Illinois were employed as field centers. Quantitative and qualitative information pertaining to the effectiveness, convenience, usefulness, and reliability of the aid were collected throughout the year-long study. The stationary Auto-Com's appropriateness and overall value to the intended target population was then judged.

Overall, the results of this first pilot test indicated that the stationary Auto-Com was successfully implemented in various educational environments and was shown to be of value as an aid to the educational and communicational development of the non-vocal, motorically impaired child.

One of the major results of this study, however, revealed that the Auto-Com would need to be made portable if it were to be an effective communication aid. All of the students in the study used the Auto-Com daily for educational purposes, but many found that, because it was stationary and could not be moved from room to room or from classroom to home, that it was not truly effective as a communication aid. As a result of student, teacher and parent reaction to the stationary feature of the aid, a new portable version was developed and made ready for use in May of 1974. It was felt that the portable version of the Auto-Com would be much more applicable as both a communication and educational aid.

A second evaluation was then initiated in order to: field test the portable Auto-Com; to continue research into the use and applicability of communication ands and generate longitudinal information on this topic; and to evaluate the overayl effects and benefits of providing effective communication modes to non-vocal severely handicapped children.

D. A Field Test of the Portable Auto-Com -- Goals and Objectives

Overall, the second field test was designed to continue investigation into the effectiveness of the Auto-Com as a communication and educational aid and to compare the stationary Auto-Com with its newer, portable version. The newer model had been placed with three students who had been using stationary Auto-Coms during the preliminary evaluation program.

Specific objectives of this field test included the following:

(1) To investigate the effect of the Auto-Com[1] on the non-vocal, cerebral palsied child's acquisition of basic educational skills.

(2) To investigate the effectiveness of the Auto-Com in increasing speed and accuracy of communication.

(3) To investigate whether or not the Auto-Com is used primarily as an educational aid or as a communication aid.

(4) To investigate the degree of independence which the Auto-Com allows the user.

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[1] Reference to "Auto-Com" here includes both stationary and portable versions.

(5) To evaluate student's reaction to using the Auto-Com as an educational and communication aid.

II. METHODS AND PROCEDURES

A. Description of the Auto-Com

Each of the students in this study was provided with Auto-Monitoring Communication Boards (Auto-Coms) which served as their primary mode of communication. During the first preliminary evaluation program, each of the students had received a stationary model of the Auto-Com. In the second field test, four of the students continued to use the stationary model and three students were provided with the new, portable Auto-Com.

Stationary Auto-Com

The stationary Auto-Com was designed to be similar, in both appearance and operation, to a traditional language board or letter board (see Fig. 1). In both cases, a child communicates by pointing to the components of his message, which are displayed on a hard, smooth surface. With a traditional board, however, a second person is required to monitor the child's erratic pointing, to memorize or record the components of the message as they are indicated, and to determine the child's total message. This process is time consuming and demands the total attention of the second person.

The stationary Auto-Com was developed to allow a child to communicate without the aid of a second person. A special electronic circuit within the board monitors the sporadic movements of the child and determines the correct letter automatically (see Fig. 2). Once the child selects a letter, the stationary Auto-Com prints it on a display (see Fig. 3). In this manner, the child is able to compose a message entirely on his own. A second person is required only to respond as he would to a vocal question or comment.

The actual operation of the stationary Auto-Com is very simple, requiring only several minutes of instruction. The child indicates his choices by sliding his hand around the surface using the same gross-motor pointing skills he would use with a language board. The only difference is that he now uses a small magnet instead of a finger or knuckle to point to the message elements. The cursor magnet can be mounted in many different ways, depending upon the physical

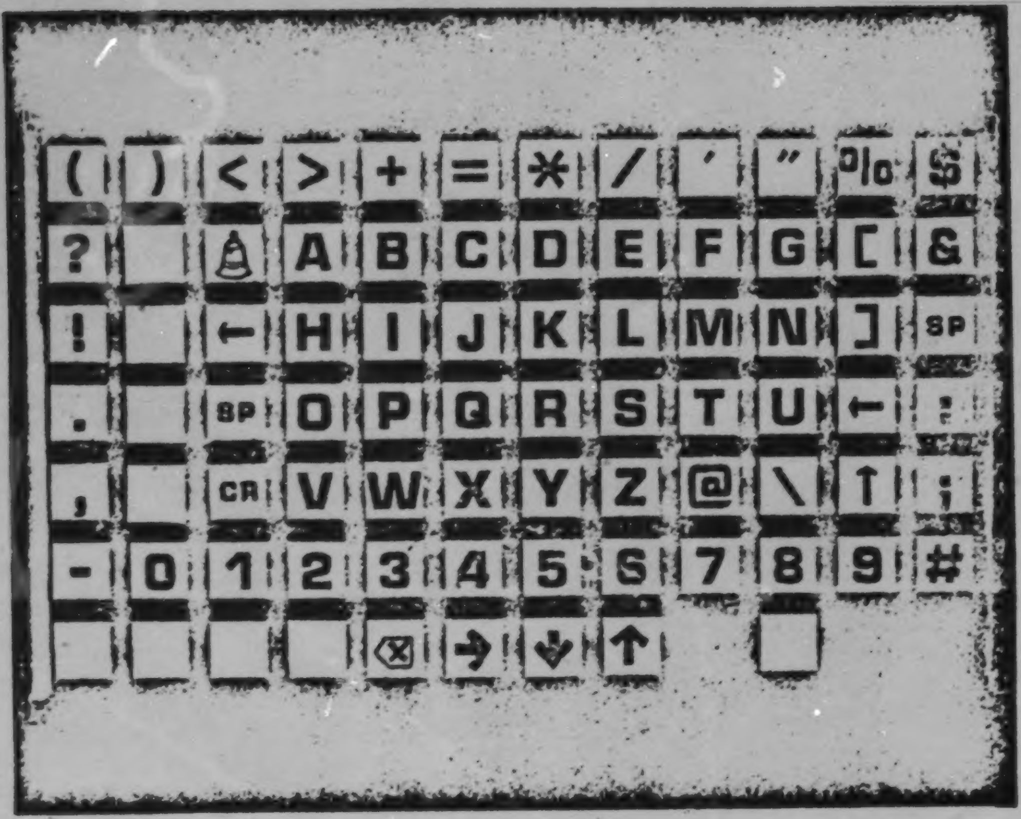
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FIGURE 1. Close-Up View of the Letter Matrix of the Stationary Auto-Com.

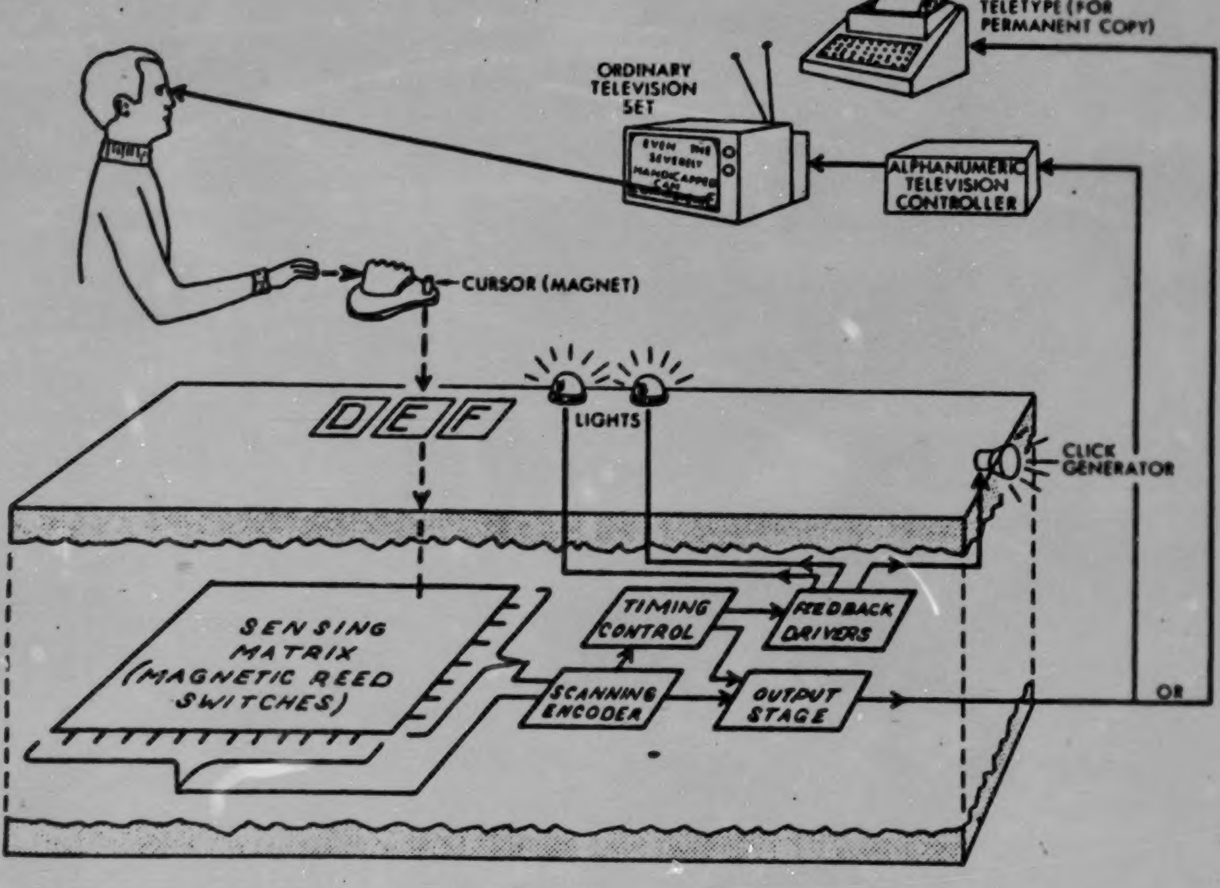

TELETYPE (FOR PERMANENT COPY)
ORDINARY TELEVISION SET
EVEN THE SEVERELY HANDICAPPED CAN
ALPHANUMERIC TELEVISION CONTROLLER
CURSOR (MAGNET)
D
E
F
LIGHTS
CLICK GENERATOR
SENSING MATRIX (MAGNETIC REED SWITCHES)
TIMING CONTROL
FEEDBACK DRIVERS
SCANNING ENCODER
OUTPUT STAGE
OR

Figure 2 Exploded diagramatic view of the Auto-Com system showing major functional blocks

abilities of the child. Headsticks, mouthsticks, wristbands, and fingerpieces have all been used to control the stationary Auto-Com simply by attaching the magnet to them. A wide variety of different shapes, sizes and forms of handpieces have also been used with the aid. For some individuals, a felt-bottomed handpiece has served to facilite the sliding motion over the board (see Fig. 4). For these people, the handpiece serves both to stabilize the individual's hand and to smooth and damp his motions. Other individuals are using the magnet mounted on a wristband, both for convenience and to eliminate problems due to irregular hand motion (see Fig. 5). In some cases, a single child may have several cursor systems (such as a wristband with a magnet in it and a standard slider handpiece), which he switches back and forth depending on his situation or surroundings.

Portable Auto-Com

The portable Auto-Com is operated in the same manner as the stationary model, but offers several additional features. Whereas the stationary Auto-Com must be plugged into a wall-socket to operate, the portable model is built into a special wheelchair laptray and derives its power from rechargeable batteries. The portable Auto-Com controls the same output forms (television display, typewriter and teletype) as the stationary model and offers an additional strip printer which is built into the aid (see Fig. 6). With these added features, a child is never without a means of communication.

Another added feature of the portable Auto-Com is the Wordmaster option. The surface display of the stationary model consists of a letter-symbol matrix of 84 one-inch squares. The matrix includes the alphabet, numbers, mathematical symbols, punctuation marks, and special control squares. The portable model's Wordmaster option adds a set of commonly used words to this matrix (see Fig. 7). In addition to the common words which are printed on the surface of the board, the portable Auto-Com has a snap-in memory cartridge which can be programmed with words, phrases and sentences chosen by the individual user. This option enables the portable Auto-Com to be introduced with very young children and also increases an individual's speed of communication.

B. Students

The students who participated in the Case Study Evaluation Program included seven non-vocal, cerebral palsied students. Previous communication methods employed by the students included gestures, gross pointing, limited vocalizations and, in several cases, letter or word boards.

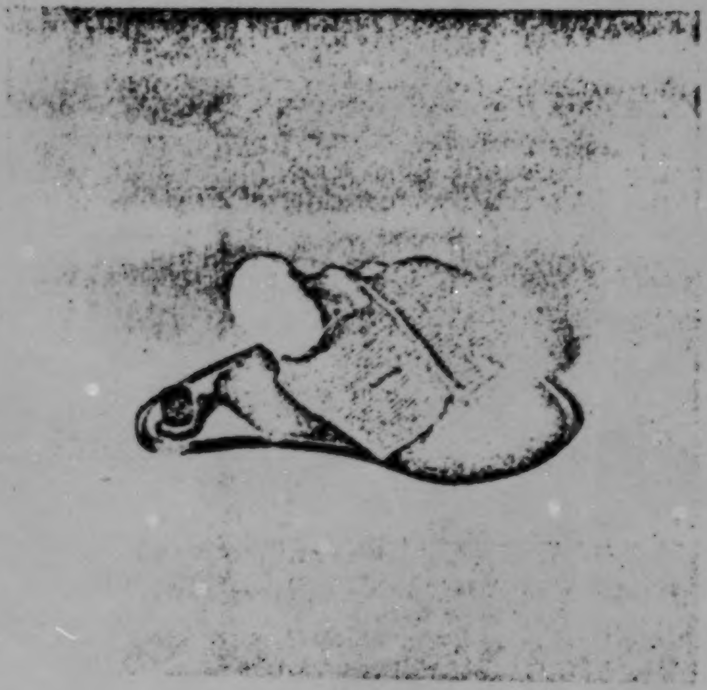


FIGURE 4. Molded Handpiece with Plexiglass Slider.

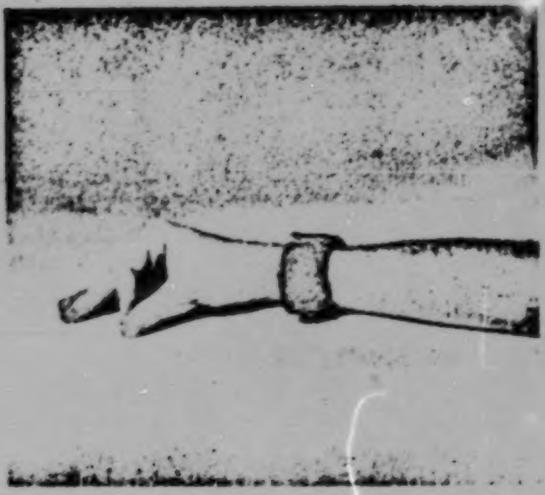


FIGURE 5. Wristband Handpiece.

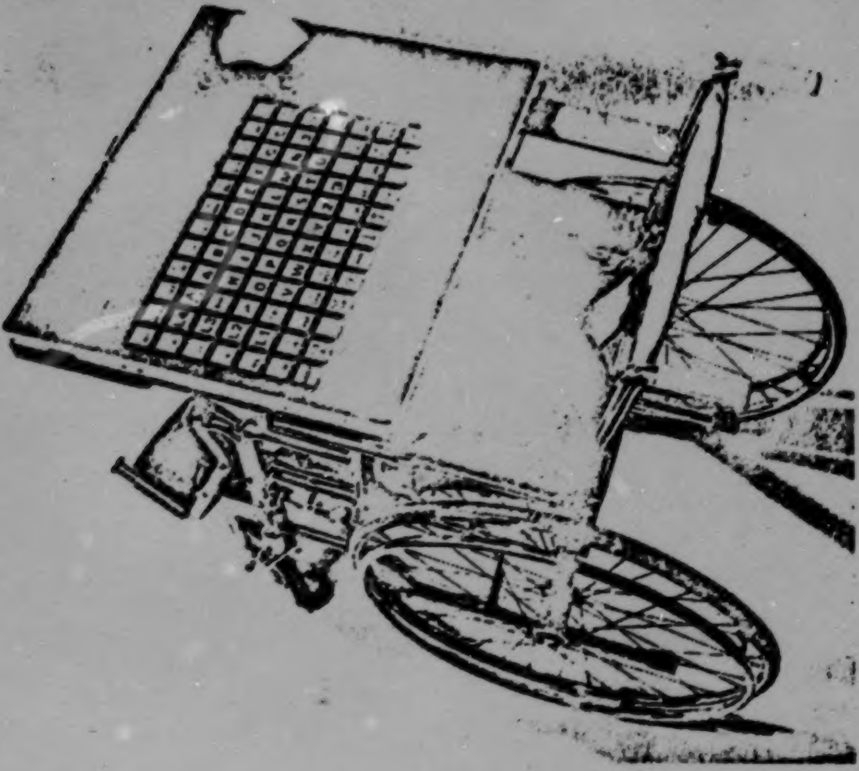
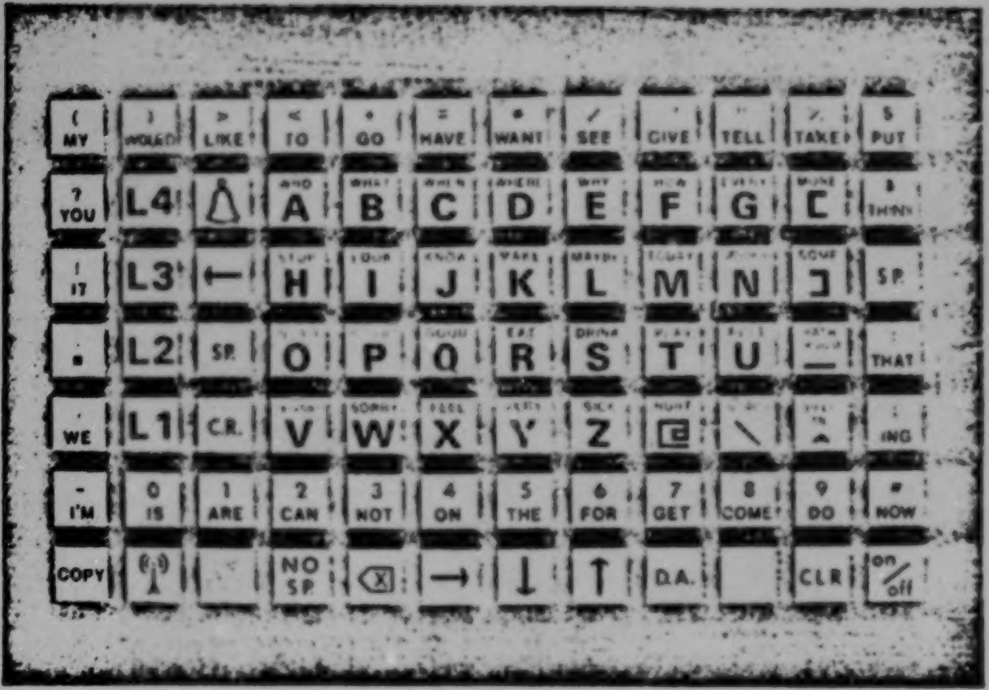


FIGURE 6. Portable Auto-Com on Wheelchair.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2 CAN
3 NOT
4 ON
5 THE
6 FOR
7 GET
8 COME
9 DO
# NOW
COPY
NO SP.
⌫
→
↓
↑
D.A.
CLR
on/off

FIGURE 7. Letter/Word Matrix of the Portable Auto-Com.

Teachers reported that guarded or masked typewriters were also tried, but all of the students lacked adequate physical skills required to effectively use this type of aid for communication purposes. Overall, the teachers considered their student's previous means of communication to be slow, tedious and frustrating.

Prior to original selection, each student was afforded a trial use of a stationary Auto-Com to determine whether he had the physical ability to operate the aid. Judgments and observations of the student's teacher, speech clinician, occupational or physical therapist, and parents were also heavily relied upon in order to determine whether or not the student required this type of an aid and would be able to operate it effectively. A final concern of the subject selection was the desire of the student and teacher to work with a new mode of communication.

Description of Subjects

Seven of the nine students selected for participation in the 1973 preliminary evaluation program continued to participate in the Case Study Evaluation Program.

The seven students who continued in the evaluation program were non-ambulatory, cerebral palsied and lacked functional speech (see Table I). One student, S_{MM}, had limited speech, enabling her to verbalize short, intelligible utterances to individuals familiar to her. However, her speech was not functional for communicating with strangers. This student was included in the evaluation program in order to determine the usefulness of an Auto-Com system as an aid to augment partially intelligible speech and as a writing aid for this type of motorically impaired individual.

Insert Table I

The students, three males and four females, ranged in age from seven to nineteen years as of September 1974. Most of the students had been educationally diagnosed as "average or near average in intellectual ability." These diagnoses were based upon past academic records and teacher judgments. The exception was S_{KS}, who was considered "severely learning disabled."

The types of educational environments of the students included a hospital school, a public elementary school, a public junior high school, and a public high school (see Table II). Five of the classrooms were described as self-contained, special education classrooms and two as resource

TABLE I. Description of Subjects

Subject	Date of Birth	Sex	Neurological[1] Description	Previous Communication Method (prior to Auto-Com)	Type of Auto-Com Used
S_{CR}	4/17/67	F	Partial spastic, partial athetoid, able to walk with aid	Gestures and pointing, no letterboard, attempted using typewriter with one finger taped in a sling - was discontinued	Stationary
S_{KS}	10/20/64	F	Spastic, quadraplegic	Gestured by shaking head, pointing; picture and letter board	Stationary
S_{DC}	10/26/53	F	Primarily athetoid, some spasticity on left side, quadraplegic	Language board, gestures with eyes and pointing with hands	Portable
S_{CC}	11/26/58	M	Athetoid, quadraplegic	Partial alphabet board and gestures	Portable
S_{LS}	3/19/60	M	Athetoid, quadraplegic	Letter board gestures	Portable
S_{MG}	7/29/59	F	Spastic, quadraplegic, severe scoliosis problem severe ATNR	Gestures with head, poor pointing skills, number board for math	Stationary
S_{TH}	11/11/60	M	Primarily athetoid, some spasticity, quadraplegic	Letter board, gestures, some communication through vocalization	Stationary
S_{DW}	10/28/60	M	Spastic, quadraplegic, hyperflexia in upper and lower extremities	Communication through gestures, some gross vocalization	Stationary
S_{MM}	11/14/56	F	Athetoid, quadraplegic, ATNR	Language board, slight speech ability	Stationary

---

[1] Descriptions were based upon neurological diagnoses provided by the staff of the University of Wisconsin Hospitals, Department of Neuropsychology and Rehabilitation, under the direction of Dr. Charles Matthews.

rooms. The types of educational programs ranged from regular education for the orthopedically handicapped to educably mentally handicapped programs. Additional supportive services which were also available to students included an occupational therapist, physical therapist, speech therapist, and, in most cases, a teacher aid.

Insert Table II

C. Evaluation Procedures and Data Collection

The data collection procedures utilized in this study were designed to obtain descriptive, investigative information relating to the interaction of each student with the Auto-Com, the use of the Auto-Com at home and school, and educational programs and curricular materials used with and/or implemented for the Auto-Com. Methods and procedures implemented included the following.

1. Systematic Teacher Feedback System

Teachers, located at the various Auto-Com field placements, served as primary observers and reporters for this program. The teachers were utilized in this capacity in order to more accurately evaluate the Auto-Com's applicability to educational environments. All but one of the Auto-Com field placements were outside the Madison area, which limited the opportunity for the researchers to directly observe classroom activities. For these reasons, a systematic teacher feedback system was developed to enhance the exchange of information between the teachers and the research group. Components of this system included formal questionnaires, classroom activity forms, periodic tracking questionnaires, taped (cassette) feedback, observational visits, and weekly phone calls.

2. Standardized Achievement Tests

The students who participated in the evaluation of the Auto-Com were administered a series of neurological test batteries. The tests were administered for the research group by the staff of the Department of Neurophysiology and Rehabilitation, University of Wisconsin Hospitals, under the direction of Dr. Charles Matthews. The purpose of these assessments was to provide comparative results for teacher-constructed tests and academic assessment measures which were under development by the research group. The test

TABLE II. Description of Educational Environments

Subject	Type of Educational Environment	Classroom Description	Type of Education Program in Classroom	Supportive Services Supportive Services
S_{CR}	Public Elementary School	Self-contained Special Ed Classroom	Multi-handicapped	Teacher Aide Occupational Therapist Physical Therapist Speech Therapist
S_{KS}	Hospital School	Self-contained Special Ed Classroom	Educational mentally handicapped + regular education for orthopedically handicapped	Teacher Aide Occupational Therapist Physical Therapist Speech Therapist
S_{DC}	Public High School	Resource Room	Regular education for orthopedically handicapped	Teacher Aide Occupational Therapist Physical Therapist Speech Therapist Homebound Teacher
S_{CC}	Public Elementary School	Self-contained Special Ed Classroom	Regular education for orthopedically handicapped	Teacher Aide Physical Therapist Speech Therapist
S_{LS}	Public Junior High School	Self-contained resource room	Regular education for orthopedically handicapped + learning disabled	Occupational Therapist Physical Therapist Speech Therapist
S_{TH}	Public Elementary School	Self-contained Special Ed Classroom	Multi-handicapped	Teacher Aide Occupational Therapist Physical Therapist Speech Therapist
S_{MM}	Hospital School	Self-contained Special Ed Classroom	Regular education for orthopedically handicapped	Teacher Aide Occupational Therapist Physical Therapist Speech Therapist

battery consisted of: Peabody Picture Vocabulary Test, Raven Progressive Matrices, Knox Cube Test, Columbia Mental Maturity Scale, Peabody Individual Achievement Test, and Boston Speech Sounds Picture Test.

3. Academic Assessment Measures

Initial work on the development of alternative academic assessment measures for non-vocal, motorically impaired students, which began during the preliminary evaluation program, was continued in this program. The activities which were undertaken during this program included a "search of the literature" and the modification of several existing tests. The tests that were modified included the Wisconsin Tests of Reading Skill Development, the Key Math Diagnostic Arithmetic Test, and the Silent Reading Diagnostic Tests #1 and #2. These modified tests were field evaluated during the second Auto-Com field test.

4. Physical Skills Assessment Inventory

Efforts to develop a physical skills assessment inventory were also initiated during this program. This inventory was to assist in the screening of future potential Auto-Com candidates. Specifically, the assessment inventory was developed to help determine the most effective interface(s) required by a motorically impaired child. The basic physical skills which the inventory was designed to assess included: range of motion, hand strength, visual acuity, speed and accuracy of movement, and pointing ability. This inventory was also evaluated during the second Auto-Com field test.

5. Parent Contact and Questionnaire

Members of the research group kept in periodic contact with parents of children involved in the evaluation program. The methods employed for parental contact were phone calls, correspondence, home visits, and a questionnaire. The purpose of these formats was to elicit parental reaction to their child's use of the Auto-Com and to physical aspects of the aid. Most of the formats utilized were kept informal, with the exception of a more formal parent questionnaire which was designed to obtain specific parental reactions to their child's use of the aid.

6. Student Newsletter

During this program, a series of student newsletters were compiled by the research group and distributed to participating students. Articles for the newsletters were supplied by the handicapped students and organized by members of the research group. The purpose of the newsletter was to provide the students with an opportunity to communicate with each other and to obtain examples of work performed by the students on the Auto-Com.

III. RESULTS -- DISCUSSION OF FIELD CENTER REPORTS

In an effort to present the results of the field test program in the most succint manner possible for this report, the data has been summarized in a descriptive manner and categorized according to educational vs. communicative use of the Auto-Com. A summary of the information will be provided as a conclusion to this section.

A. Classroom Application of the Auto-Com

During this study it was found that while in the classroom the Auto-Com was used primarily as an academic/educational aid rather than as a communication aid. According to teacher reports, this was due to the Auto-Com's facilitation of academic instruction and students' improved responses to educational programs. Teachers commented that as much as 80% of their students' total amount of classroom work involved the use of the Auto-Com. Specific educational skills taught through the use of the aid varied with each student and were primarily dependent upon skills acquired or skills which teachers assumed were acquired by a student prior to receiving the Auto-Com. Overall, these skills included: arithmetic skills (from recognition of numbers to algebraic equations), sentence construction, spelling, acquisition of reading skills, vocabulary development, comprehension skills, computer programming, and self-expression.

Academically, the Auto-Com was employed in tutorial and structured teaching, the completion of assignments and tests, classroom discussions, and, in one case, aiding limited verbal communication. Teachers commented that both the stationary and portable Auto-Coms adapted very well to existing curriculums and that fewer modifications of curriculum materials were required as compared to their previous modes of instruction (letterboards, gestures, etc.). Educational materials and programs which were successfully utilized in conjunction with both Auto-Coms included: Distar, Fountain Valley Reading System, Sound Foundations, S.R.A. Reading Series, and Ginn and Hold elementary arithmetic curriculums.

In instances where modifications were required to enhance instruction, teachers found that they were able to develop individualized instruction around the existing capabilities of the Auto-Com. One area of instruction which required adaptations involved the display of mathematical problems. To solve a simple two-digit addition problem, a student would be required to perform sixteen operations on the Auto-Com. Both the teachers and the students found this to be frustrating and time consuming. Consequently, teachers developed mylar overlays for the television display which only required the students to "fill in" the correct numbers. In another instance, a method of displaying algebraic superscripts and exponents was devised: 3C11 signified $3C^2$, 3C111 signified $3C^3$, and so forth. In addition to facilitating instruction, these adaptations furthered the students' independence.

Considering the total amount of classroom activities, students primarily used the Auto-Com for the completion of independent work. Teachers placed a great emphasis on this because for the first time the Auto-Com allowed their students to complete academic work on their own. In several cases, teachers enhanced their students' independent work by employing cassette tape recorders in conjunction with the Auto-Com. Several students received instructions from taped lessons and performed their work on the Auto-Com, thus eliminating the need for a teacher aid to read task instructions. For one student, who had visual problems which interfered with the reading of text books and curriculum materials, lessons and instructions for skill tasks were also recorded on cassette tapes. The student would listen to the tape and then perform his work on the Auto-Com, employing a large screen television for a clear visual display.

A classroom profile of typical daily routines and use of the Auto-Com within various routines appears in Table III.

Insert Table III

B. Effect of the Auto-Com upon Students' Educational Progress

Teachers reported that the educational experiences of the students in this study were greatly facilitated through the use of the Auto-Com. Prior to receiving the aid, most of the students' classroom activities were restricted by their limited ability to initiate conversations and questions. In addition, acquisition of basic educational skills had been affected by inordinate amounts of teacher time and effort required to elicit and record student responses. The introduction of the Auto-Com provided these students with their

TABLE III

Average Classroom Activities[1]				Average Hrs./Day Use of Auto-Com	Classwork Involving Use of the Auto-Com			Situations Where Auto-Com Was Used Most
Hrs./Day 1:1 instruction	Hrs./Day Group instruction	Hrs./Day Physical Therapy	Hrs./Day Other Activities		% of in-class academic work	% of class discussion	% of independent work	
2 hrs.	2 hrs.	½ hr.	1½ hrs.	4½ hrs.	80%	20%	100%	general communication, printed copy, art work, letter writing, math, playing chess
5 hrs.	2 hrs.	½ hr.	½ hr.	4 hrs.	40%	20%	100%	general communication, letter writing, art work, computer programming, tests, creative writing, playing tic-tac-toe
5 hrs.	3 hrs.	1 hr.	1 hr.	4 hrs.	80%	5%	80%	supplement other attempts at communicating (e.g. gestures), "hard copy" work, art work, letter writing
1 hr.	3 hrs.	½ hr.	1½ hrs.	3 hrs.	60%	5%	70%	math, general communication, "hard copy" work
½ hr.	4 hrs.	1 hr.	1½ hrs.	2½ hrs.	30%	5%	70%	to supplement limited verbal communication, all "hard copy" work, tests
½ hr.	3½ hrs.	½ hr.	1 hr.	1 hr.	70%	5%	80%	math, spelling and vocabulary development, supplement other attempts at communication (e.g. gestures)

first consistent and dependable means of independent communication. This was viewed by the teachers as the first step toward effective and productive educational participation for these students.

The Auto-Com enabled these students to take an active role in classroom activities by providing them with a means to produce and correct their work independently (see Fig. 8). Teachers reported that,with the Auto-Com their students were able to complete more comprehensive work which was of higher quality in less teacher time. Consequently, teachers were able to develop more detailed lesson plans and expose their students to a greater diversity of skills within various curricula. This proved to be challenging to many of the students and resulted in marked improvements in their motivation and quality of work. As one teacher remarked:

> "I think he might have had the attitude that 'Why? Nobody's going to understand me anyway.' Now S_{CC} really likes it and uses it for long periods without getting discouraged. He works long hours on the Auto-Com without getting tired."

TABLE IV. Effect upon Student's Educational Progress

Student	Learning faster & more completely	Learning faster & less completely	No effect	Learning slower & more completely	Learning slower & less completely
S_{LS}				X	
S_{DC}	X				
S_{TH}	X				
S_{CR}				X	
S_{MM}	X				
S_{CC}				X	
S_{KS}				X	

The Auto-Com's correctable visual display required the students to answer questions and to solve problems independently for the first time. As a result, teachers stated that they were able to more accurately assess their students' knowledge and progress in basic educational skills. This was especially noted in the areas of math, spelling, sentence

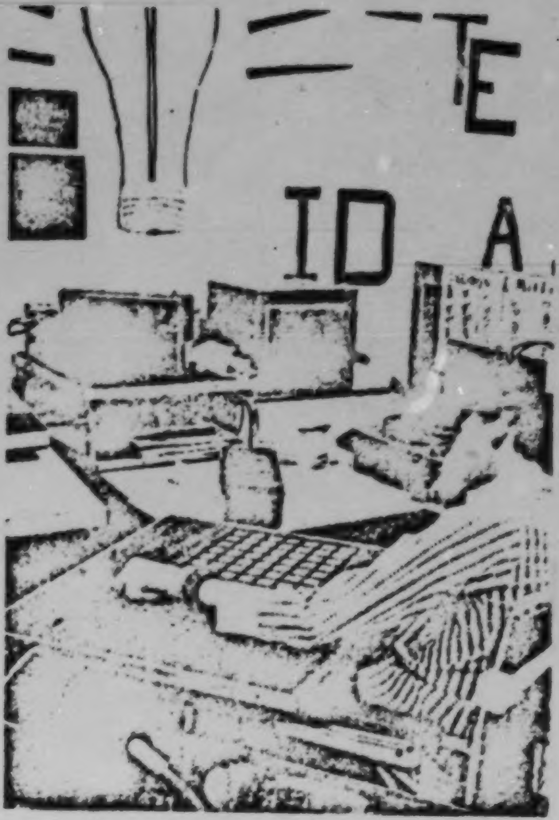

FIGURE 8. S_{CC} Using Portable Auto-Com to Complete an Assignment.

structure and reading comprehension. Prior to the Auto-Com, academic assessments were structured in a multiple choice format and were affected by "telegraphic" communication, unconscious cluing by testers, and guessing on the part of the students. Through academic assessments employing the Auto-Com, teachers discovered that students had not mastered basic concepts or processes which they had assumed the student had acquired. This was especially true in math where, prior to the Auto-Com, someone else consistently performed the operations for the students.

All of the students were reported to have progressed to some degree in the acquisition or development of basic educational skills. The Auto-Com was shown to be especially functional in facilitating the acquisition and development of math skills: two students were involved in addition and subtraction problem solving; two began multiplication and division; and two others progressed to algebra. Notable improvement in math skills progress was pointed out by teacher evaluations, math tracking quizzes, and formal assessment measures. In nearly each case of stated improvement, it was mentioned that the Auto-Com was instrumental in facilitating the progress. The ability of students to perform their own work on the correctable, visual display was considered to be the principal contributing factor to the improvements.

Improvement in spelling, sentence construction, and vocabulary development were also reflected in teacher evaluations and standardized achievement tests. Development of these skills was enhanced by the Auto-Com providing the students with their first opportunity to see and correct their letters as they formed words and sentences. As one teacher commented:

> "S_{TH} has improved 100% in writing complete sentences. He now has to write his spelling words in sentences and has to answer comprehension questions after reading in sentences. Complete sentences were never necessary before the Auto-Com, so it was difficult at first to write in complete sentences. Since using the Auto-Com, I have been able to look at parts of speech left out and work on these."

TABLE V. Skill Improvement

	SPELLING				COMPLETE SENTENCES				READING & WRITING VOCABULARY			
	no noticeable difference	somewhat	pretty much	greatly	no noticeable difference	somewhat	pretty much	greatly	no noticeable difference	somewhat	pretty much	greatly
S_{CC}				X				X				X
S_{DC}		X					X					X
S_{KS}		X			NA				NA			
S_{LS}		X				X				X		
S_{MM}	X				X					X		
S_{TH}			X					X			X	
S_{CR}			X			X					X	

Teachers considered the Auto-Com to be of tremendous value to their students' acquisition and development of educational skills. One teacher commented that, with the Auto-Com, she could teach her student in two years what normally would have taken more than three. Later she rescinded her earlier estimate and said "the increase in learning rate time was immeasureable." Overall, teachers reported that the Auto-Com's greatest effects on the student's skill progress were providing the opportunity to complete tasks independently, the elimination of costly hours of one-to-one instruction, and the opportunity for students to see and correct their work. Consequently, the students were able to spend a greater total amount of productive time in the classroom, were able to learn skill tasks in more detail, and participate in a greater amount and diversity of skills and instructional tasks (see Table VI).

TABLE VI. Degree of Independence and Teacher Time Spent

Subjects	Less independent; demands more teacher time	Same as before	Somewhat more independent; teacher time spent somewhat less	Much more independent; much less teacher time spent
S_{CC}				X
S_{DC}				X
S_{XS}	X			
S_{LS}				X
S_{MM}				X
S_{TH}				X
S_{CR}	X (in a group situation)	X (in individual work		

C. Effect of the Auto-Com upon Students' Communication Skills

The Auto-Com's major effect upon the students' communication skills has been in providing them with a means of totally expressing their thoughts and opinions without requiring a second person to interpret and translate for them. With the correctable visual display, the students were able to see what they were communicating and to correct their own mistakes. This significantly reduced the pressure students felt from taking a large amount of an individual's time to convey a message. Furthermore, the portable model of the Auto-Com, equipped with a sub-miniature strip printer[1], allowed the students to express themselves independently and privately if they wished in virtually any environmental setting. Overall, the Auto-Com provided an effective mode of response and a means of communicating with others that far surpassed the students' prior methods of communication.

The ineffectiveness of two of the communication methods previously available to the students is illustrated in Figs. 9 and 10. It was estimated that it took S_{CC} approximately three minutes to complete the communication represented in Fig. 9. This student is now able to print out sentences

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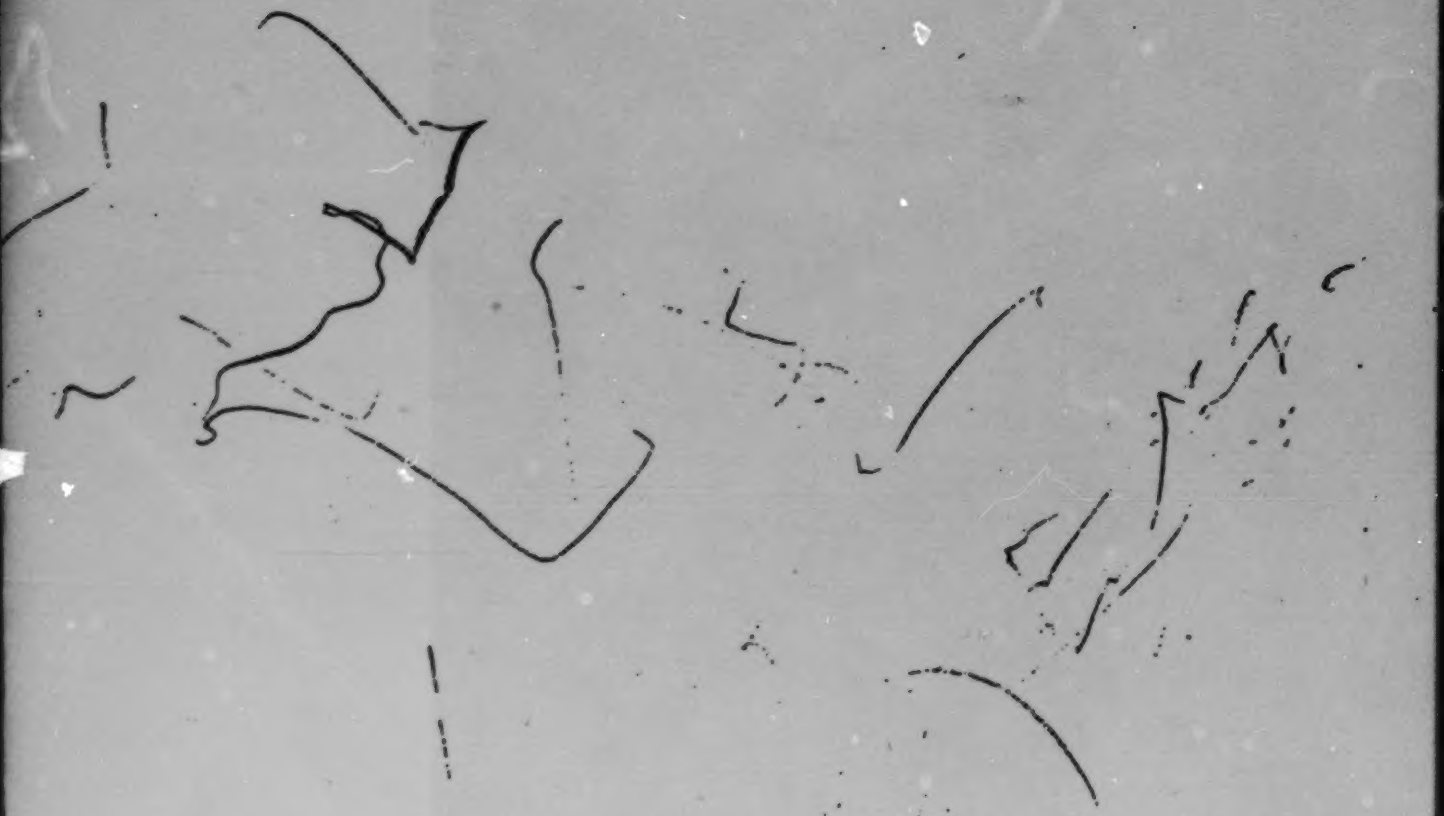
[1] The sub-miniature strip printer records messages on a small tape.



"CRAIG"

FIGURE 9. S_{CC} Attempting to Print His Name (3 minutes).

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G    BY  I           H    , L UH         U       Y*PI       O U
```

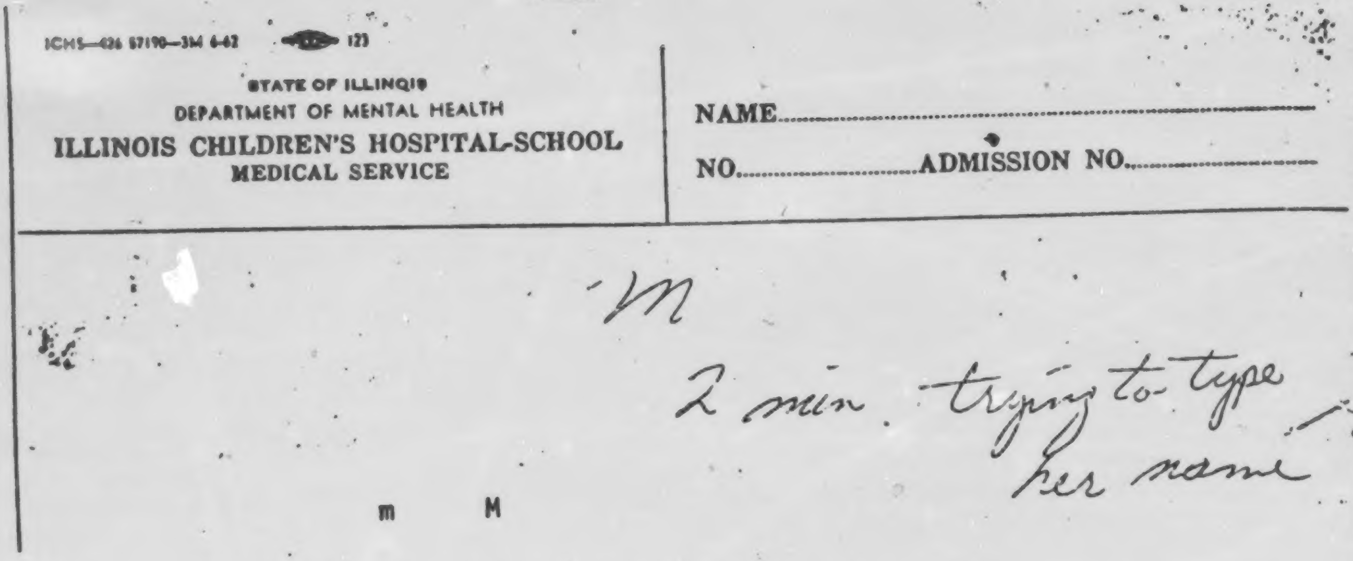
FIGURE 10. S_{CC} Attempting to Type His Name Using a Masked Typewriter (3 minutes).

such as "I com home eat wach TV 365 days nuts!" in five minutes with the Auto-Com. Figure 11 represents a two-minute attempt by S to type her name. Using the Auto-Com, this student was able to respond to a classroom question in less than five minutes by printing the following:

> "Yes, there is a difference between the price and the value of a product. The cost may be low, but if you don't need the product, it doesn't have any value. If you have been saving up for a sterio and then you see a watch that you want, you have to decide weather the watch has more value than the watch."

During this study, it was found that the students began to utilize the Auto-Com in a greater number of situations as they became more proficient in its use. At first, the Auto-Coms were primarily employed in the completion of in-class academic work, but, in most cases, they were increasingly used for expressive communication. Several of the students with portable Auto-Coms began to take their aids home and to summer camp to aid their communication with family members and friends. In addition, the portable Auto-Com's strip printer enabled students to write personal notes and letters to friends. One of the students also discovered that the Auto-Com had provided him with a totally new method of expression and quickly passed it on to the others. What he had discovered was that the Auto-Com could be used to create artwork (see Fig. 12).

The students' increased utilization of the Auto-Com for communication resulted in an important effect upon their vocalizations. A primary concern among educators and parents is that the child who has very limited speech or only a few vocalizations will stop vocalizing if provided with a communication aid. Teachers in this study have noted that the students' vocalizations increased when they began to use the Auto-Com. They felt that the use of the Auto-Com allowed the child time to complete his sentences and thoughts without having the pressure of someone constantly waiting for him to speak. This decrease in pressure helped the child to relax to communicate clear, unambiguous thoughts at his own speed. The students' vocalizations increased over time once they became aware that the transmission of their message was not solely dependent upon the intelligibility of their vocal word approximations.



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STATE OF ILLINOIS
DEPARTMENT OF MENTAL HEALTH
ILLINOIS CHILDREN'S HOSPITAL-SCHOOL
MEDICAL SERVICE

NAME..

NO.......................ADMISSION NO........................

M

2 min. trying to type her name

m M

FIGURE 11. S_{MM} Attempting to Type Her Name Using Masked Typewriter (2 minutes).

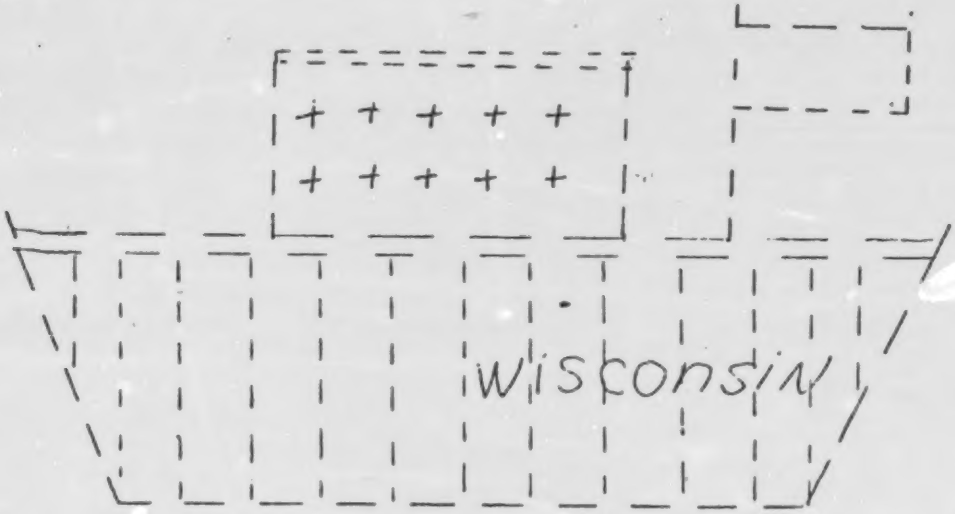

FIGURE 12. Example of Artwork Drawn Using the Auto-Com.
[Scc]

V. SUMMARY

One of the primary goals of this program was to investigate the effect of the stationary and portable Auto-Coms upon the students' acquisition of basic educational skills. Based upon teacher comments and the previous discussion, it can be concluded that both versions of the aid have had significant impact on the students who participated in this study. These students, who were previously unable to do much more than observe classroom activities, have now become active participator- in their educational programs and are able to produce evidence that they are quite able to think, to learn and to communicate.

As a general teacher reaction, both Auto-Coms were considered to be of significant value in helping the students acquire and develop basic skills. Teachers were able to instruct students in a more direct and less time-consuming manner. In addition, they were able to spend greater amounts of productive time with each student. Teachers commented that one of the most exciting features of the Auto-Com was its ability to allow for accurate assessment of the student's competencies and deficiencies.

The Auto-Com was reported in nearly all cases to give students personal satisfaction and motivation to learn. This was especially noted with the portable Auto-Coms. Students using this aid were able to communicate in virtually any environment for the first time, and expressed strong desire to do so. The Auto-Com has also had effects on the social and personal development of the students. Teachers and parents report that the children are expressing their own opinions now and taking on a more active role in family relations.

Other important findings reveal that rather than decreasing vocalizations which may have been used as previous means of communication, these vocalizations have been observed to increase.

In comparing the stationary and portable models of the aid, three primary features were shown to be significant to successful use of the Auto-Com and integration of it into the school and home lives of the students. These three features were:

(1) independence,
(2) visible, correctable display, and
(3) portability.

Nearly all teachers and parents commented upon the Auto-Com's ability to free their time and to allow students to complete work on their own. Teachers were able to spend more productive hours with students, and parents were more free to carry out daily family activities once the burden of spending many hours of translating their children's messages was relieved from their schedules. The students were then able to complete work at their own pace without constant supervision and were thus given both privacy and the ability to communicate under less pressure and time constraint.

The visible, correctable display was shown to be of significant importance in the students' development of basic communication and vocabulary skills. They were, for the first time, able to see their letters form words, and words form sentences, and could correct and change their output until it appeared as the final product they desired. Because students were able to do this, teachers and parents were able to more accurately view the learning processes which the students were going through prior to writing a message or performing a math problem.

Portability was an important feature for communication. Preliminary studies showed that to be successful as an augmentative "voice" for the child, it had to be able to be easily transported with the child into virtually any environment. It was noted during this study that those students using portable Auto-Coms used their aids during more total hours of the day and that they completed more independent work with these aids than those students using stationary Auto-Coms. It was also noted that students using portable aids participated in a greater percentage of class discussion than those students using stationary aids.

As a result of direct observation and parent, teacher and child reaction, it has been shown that, while both versions of the aid were of significant importance in the development of basic educational skills, the portable Auto-Com was seen as a more effective communication aid in that it allowed the child to communicate wherever he went in his wheelchair rather than confining his communication to a stationary study carroll or desk.

The results of this study are encouraging and point to the need to develop and implement effective communication modes for severely handicapped children. While the Auto-Com was the aid used in this particular study, it is felt that many of the results noted would have occurred with the use of other types of aids, as they are directly related to providing the students with their first effective means of communication. The overall effect of providing effective communication has been demonstrated here along with effects specifically the result of certain features of the Auto-Com.

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APPENDIX G

An Evaluation Report on the Voxcom

An Evaluation Report on the Voxcom

Jenny R. Armstrong, Ph.D.

Introduction. During FY 75 a meeting was held with the President of Tapecon Inc. regarding the concern of the Specialized Office Three Project for the provision of materials compatible with the needs of the handicapped served by the project. At this time, the President of Tapecon Inc. also had a concern for making one of their products, the Voxcom, available to and appropriate for use with the handicapped. Also, the President of Tapecon, Inc. was interested in obtaining information from teachers on different uses for the equipment.

Sample. During FY 75 and the first two quarters of FY 76, three Voxcoms were placed in four different educational programs. The educational programs were: (1) The St. Francis Activity and Achievement Center; (2) Wisconsin Central Colony School; (3) Badger School - Madison Public Schools; and (4) the Waisman Center School at the University of Wisconsin. The students involved in the tryouts of the Voxcom varied among the four schools. At St. Francis the pupils ranged from severely multiply handicapped to mildly and moderately handicapped and ranged in age from preschool to age 8. At Central Colony the pupils were severely and profoundly handicapped and ranged in age from 6 to adult. At Badger School the pupils were severely, profoundly and multiply handicapped and ranged in age from 6 to 16. At the Waisman Center School pupils ranged in age from 3-4 and were mildly and moderately emotionally disturbed.

Results. The reports on the Voxcom were quite mixed. One teacher found that the directions were difficult to read and understand, and consequently did not use the Voxcom with the students. The Voxcom was reported to be more portable than the Language Master, but was limiting due to the fact that it could accomodate only a single stimulus. The use of an external rather than an internal microphone was found to be good because of the problems with internal microphones picking up a lot of noise.

Some items which were identified by another teacher which might be adapted if the machine was to be used with handicapped children with low level functional and/or perceptual-motor development were: (1) making the buttons easier to push; (2) spacing the buttons farther apart; (3) reducing the number of buttons involved in the operation of the machine; (4) coding the buttons with colors or symbols to make them easier to identify and associate with machine operation for the pupil; and (6) making the tape easier to put on the cards to be made to run through the machine. Some of the favorable aspects of the machine were: (1) the detachable card reader and (2) the two speed option inclusive of the slower speed. It was also suggested that a repeat button which would repeat the card information as often as the pupil pushed the button was also recommended.

Another teacher recommended that this machine not be used with preschool level mildly/moderately emotionally disturbed pupils because of its lack of ease of use by these pupils. It was also recommended that a training package on the use of the Voxcom be developed to assist the teacher in understanding how to better use the Voxcom . The Voxcom was recommended for use with primary and intermediate level specific learning disabled, but was not specifically tried out with these pupils.

When using the Voxcom with severely and profoundly and mildly and moderately retarded handicapped pupils in the preschool age range to teach language and articulation, it was found that more play/record time was needed for the student to react after hearing the voice. Another teacher working on the same types of objectives with the same level and handicapping conditions found the maneuverability (size, weight, compactness) very good features of the machine. It was suggested, however, that the talk/sleeve cards be made longer to accomodate more information. This teacher also recommended some training or instructional time before using the Voxcom.

Recommendations from yet another teacher involved labeling the buttons with the words, "TALK" or "STOP", and reducing the stimulus both visual and motion that was provided by the machine. The machine was found to be "over-stimulating" for some of the handicapped children in the tryout. Again the need for teacher involvement with the machine in a use-training capacity was emphasized.

Conclusions. The Voxcom was found by these teachers to be useful with the handicapped pupils they taught in most cases. There were, however, several suggestions made for adapting the Voxcom to make it more useful with handicapped children. These recommendations have been cited in the results section and will not be restated here. It was emphasized by all of the teachers that clearer instructions in the use of the machine should be provided. This could perhaps be provided vis-a-vis the construction of an instructional guide.

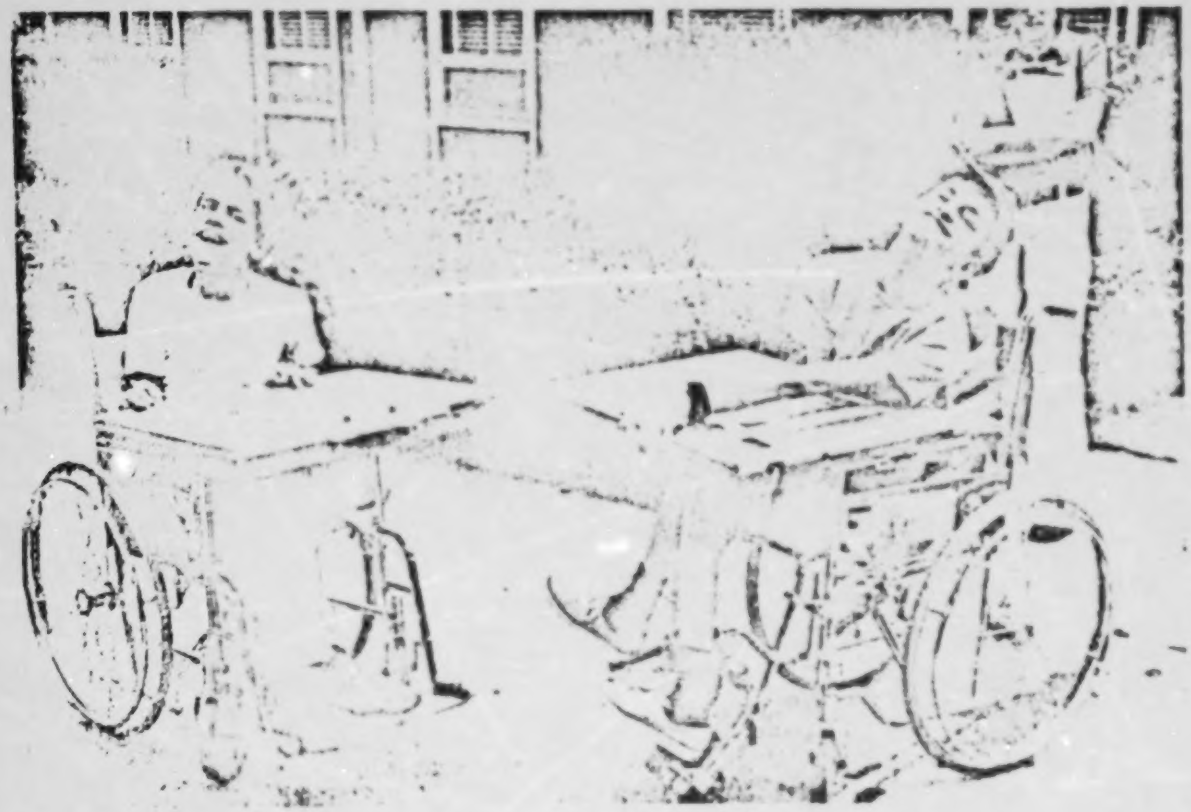
APPENDIX H

Field Evaluation of the Portable Auto-Com

SUMMARY REPORT

FIELD EVALUATION OF THE PORTABLE AUTO-COM

A Communication Aid for Non-Vocal Severely Handicapped Children and Adults



Deberah Harris-Vanderheiden
Richard Schutz

Trace Research & Development Cent

October 8, 1975

I. INTRODUCTION

A. Statement of the Problem

It is encouraging to note that, with the passage of recent federal and state legislation, severely handicapped children who have heretofore been excluded from most educational opportunities now have been given the right to enter into public school educational programs. A major concern among parents, educators and clinicians involves the school system's ability to appropriately meet the special educational needs of these children. Specifically, the concern involves educators' and clinicians' preparation to design effective educational programs which will provide these children with meaningful education which they deserve.

One of the most difficult populations to include in public school programming will be non-vocal severely motorically impaired children. These children are unable to communicate, except through gross gestures and pointing, or effectively interact and transport themselves in their environment without the support of a variety of assistive aids. Although their physical disabilities and need for various therapies may preclude them from complete mainstreaming into regular educational classes, it is their communicative deficit which will (and has) preclude them from effective and meaningful interaction in almost any instructional/learning environment.

These children, unable to speak and, in some cases, unable to gesture or point due to severe motor involvement require extensive one-to-one instruction and are very dependent upon others to interpret their needs and wants.

Their inability to respond in an effective and consistent way to their environment, along with their inability to take tests, perform manipulative tasks, respond to questions or conversations of others, initiate questions and conversation, or express emotions has, in the past, relegated them to a role of relatively passive observance in the classroom. Experiential and interactional deficits have severely limited their learning and educational progress and concomitant physical and communicative deficits have precluded accurate assessment of residual skills and learning which may have occurred.

Educators are now faced with the task of developing appropriate educational programs for these children. Most of the children who have been enrolled in educational programs previously will come to the classroom labeled "severely mentally handicapped"; for others, enrollment may be their first educational experience, and chronological age for these latter children may well range between 3-21 years. It will be the educator's and clinician's task to meet the educational and communicative needs of these children; but in order to accomplish this, they must be fully prepared to design and develop effective programs.

Although the educational needs and deficits of the NVPH child will be myriad, the deficit which must be remediated prior to all others is communication. In order for any educational program to provide a meaningful experience for the child, he must be provided with some means of communicating his needs, thoughts, and ideas to others. The only accurate way of assessing the child's ability to learn, or of assessing his basic skill abilities and deficits, is through communication. The child must be able to consistently and effectively respond to others and communicate his knowledge.

B. Rationale for Evaluation of Communication Aids

1. Overview of Rationale

Currently, there are many different communication aids and techniques which can overcome severe communication deficits in non-vocal motorically impaired children (Vanderheiden, Harris-Vanderheiden, 1975). These aids and techniques range from fundamental classroom constructed letter and wordboards to more advanced electronic portable aids. Although many of the aids are similar in concept or on operation, each is designed a little differently, with certain necessary skills for operation.

Just as there is a great diversity in the number and type of physical and communicative deficits which NVPH children may have, there is a great diversity in the type of communication aids available and the functions which they can serve for different children. These aids and techniques, when appropriately applied and integrated into educational programs, can overcome the severe communication deficits of a great number of NVPH children. It is of critical importance then that educators and clinicians learn of these aids and become familiar with how and when to utilize them. They must be provided with information concerning the specific characteristics of each aid; the aid's population applicability; its use and value in the educational and communication skill progress of the NVPH child; its effect upon the child's socio-emotional adjustment; teacher, parent and child reaction to use of the aid; and basic cost/benefit information on the aid.[1]

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[1] Since many of the aids will be relatively expensive, the educator needs to become aware of those benefits which the aid will provide the child which cannot be attained through other methods.

2. Review of Past Programs

The only known systematic evaluative efforts to date have been those conducted by the Cybernetics Research Institute (Kafafian, 1973), the Crotched Mountain Foundation (1966), Tufts Biomedical Engineering Center (in progress), and the one described in this report.

The Crotched Mountain study was addressed to an evaluation of "the ability of cerebral palsied persons to manipulate and control a series of switches connected to various output devices" (1966). Success in the program was measured by the individual's ability to control one or more of a series of outputs through utilization of an appropriate switch. Cybernetics Research Institute (CRI) included more observation of the use of communication aids for various classroom activities, but major focus was placed upon determining whether or not providing the children with a prosthetic aid allowed them to achieve a "usable and effective written communication capability" (Kafafian, 1973). Neither of these studies addressed itself toward assessing the educational and communication impact of providing an NVPH child with an effective means of communication. This aspect has been included in the Tufts study (Foulds, 1975) and is the primary focus of the field evaluation reported here.

C. Overview of Pilot Evaluation of the First Stationary Auto-Com

In 1973, the Cerebral Palsy Communication Group initiated a preliminary evaluation program, designed to field test the stationary Auto-Com. (See Section II.A. for picture and description of the aid.) The purpose of this program was to evaluate the stationary Auto-Com as an aid to the education and communication of the non-vocal, motorically impaired child. Nine non-vocal cerebral palsied children were selected to participate in this study and seven orthopedic classrooms in Wisconsin and Illinois were employed as field centers. Quantitative and qualitative information pertaining to the effectiveness, convenience, usefulness, and reliability of the aid were collected throughout the year-long study. The stationary Auto-Com's appropriateness and overall value to the intended target population was then judged.

Overall, the results of this first pilot test indicated that the stationary Auto-Com was successfully implemented in various educational environments and was shown to be of value as an aid to the educational and communicational development of the non-vocal, motorically impaired child.

One of the major results of this study, however, reveal[illegible] that the Auto-Com would need to be made portable if it were to be an effective communication aid. All of the students in the study used the Auto-Com daily for educational purposes, but many found that, because it was stationary and could not be moved from room to room or from classroom to home, that it was not truly effective as a communication aid. As a result of student, teacher and parent reaction to the stationary feature of the aid, a new portable version was developed and made ready for use in May of 1974. It was felt that the portable version of the Auto-Com would be much more applicable as both a communication and educational aid.

A second evaluation was then initiated in order to: field test the portable Auto-Com; to continue research into the use and applicability of communication ands and generate longitudinal information on this topic; and to evaluate the overayl effects and benefits of providing effective communication modes to non-vocal severely handicapped children.

D. A Field Test of the Portable Auto-Com -- Goals and Objectives

Overall, the second field test was designed to continue investigation into the effectiveness of the Auto-Com as a communication and educational aid and to compare the stationary Auto-Com with its newer, portable version. The newer model had been placed with three students who had been using stationary Auto-Coms during the preliminary evaluation program.

Specific objectives of this field test included the following:

(1) To investigate the effect of the Auto-Com[1] on the non-vocal, cerebral palsied child's acquisition of basic educational skills.

(2) To investigate the effectiveness of the Auto-Com in increasing speed and accuracy of communication.

(3) To investigate whether or not the Auto-Com is used primarily as an educational aid or as a communication aid.

(4) To investigate the degree of independence which the Auto-Com allows the user.

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[1] Reference to "Auto-Com" here includes both stationary and portable versions.

(5) To evaluate student's reaction to using the Auto-Com as an educational and communication aid.

II. METHODS AND PROCEDURES

A. Description of the Auto-Com

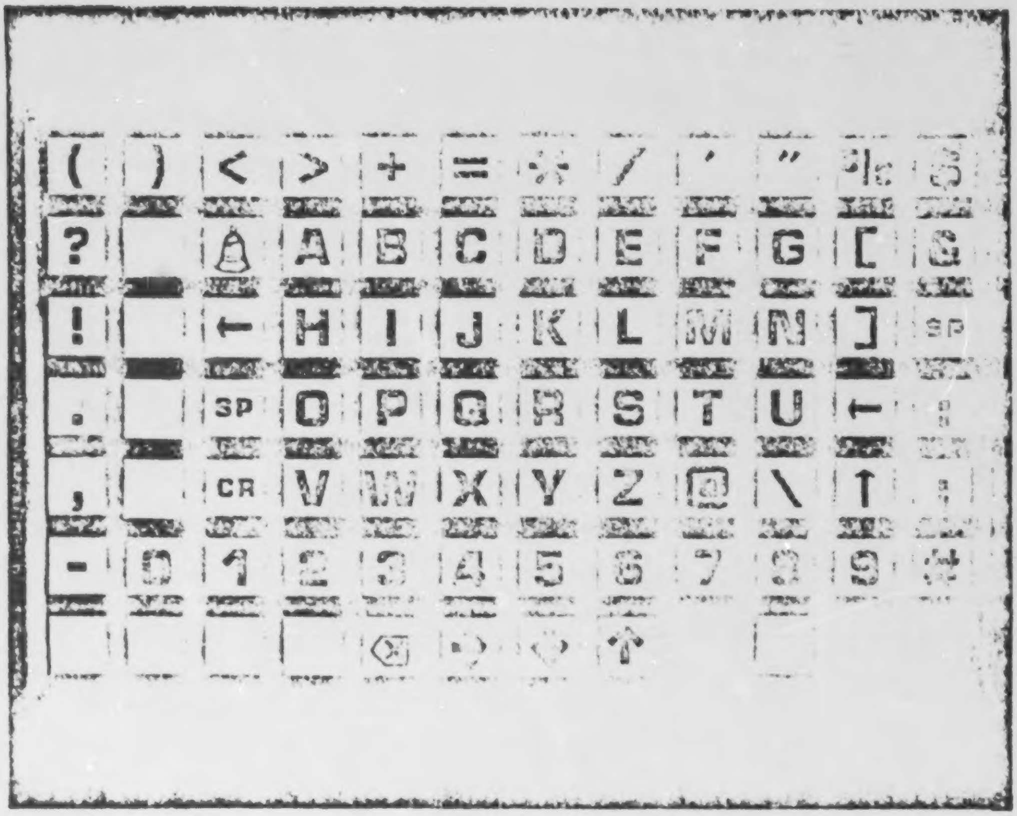
Each of the students in this study was provided with Auto-Monitoring Communication Boards (Auto-Coms) which served as their primary mode of communication. During the first preliminary evaluation program, each of the students had received a stationary model of the Auto-Com. In the second field test, four of the students continued to use the stationary model and three students were provided with the new, portable Auto-Com.

Stationary Auto-Com

The stationary Auto-Com was designed to be similar, in both appearance and operation, to a traditional language board or letter board (see Fig. 1). In both cases, a child communicates by pointing to the components of his message, which are displayed on a hard, smooth surface. With a traditional board, however, a second person is required to monitor the child's erratic pointing, to memorize or record the components of the message as they are indicated, and to determine the child's total message. This process is time consuming and demands the total attention of the second person.

The stationary Auto-Com was developed to allow a child to communicate without the aid of a second person. A special electronic circuit within the board monitors the sporadic movements of the child and determines the correct letter automatically (see Fig. 2). Once the child selects a letter, the stationary Auto-Com prints it on a display (see Fig. 3). In this manner, the child is able to compose a message entirely on his own. A second person is required only to respond as he would to a vocal question or comment.

The actual operation of the stationary Auto-Com is very simple, requiring only several minutes of instruction. The child indicates his choices by sliding his hand around the surface using the same gross-motor pointing skills he would use with a language board. The only difference is that he now uses a small magnet instead of a finger or knuckle to point to the message elements. The cursor magnet can be mounted in many different ways, depending upon the physical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- 0 1 2 3 4 5 6 7 8 9 #

FIGURE 1. Close-Up View of the Letter Matrix of the Stationary Auto-Com.

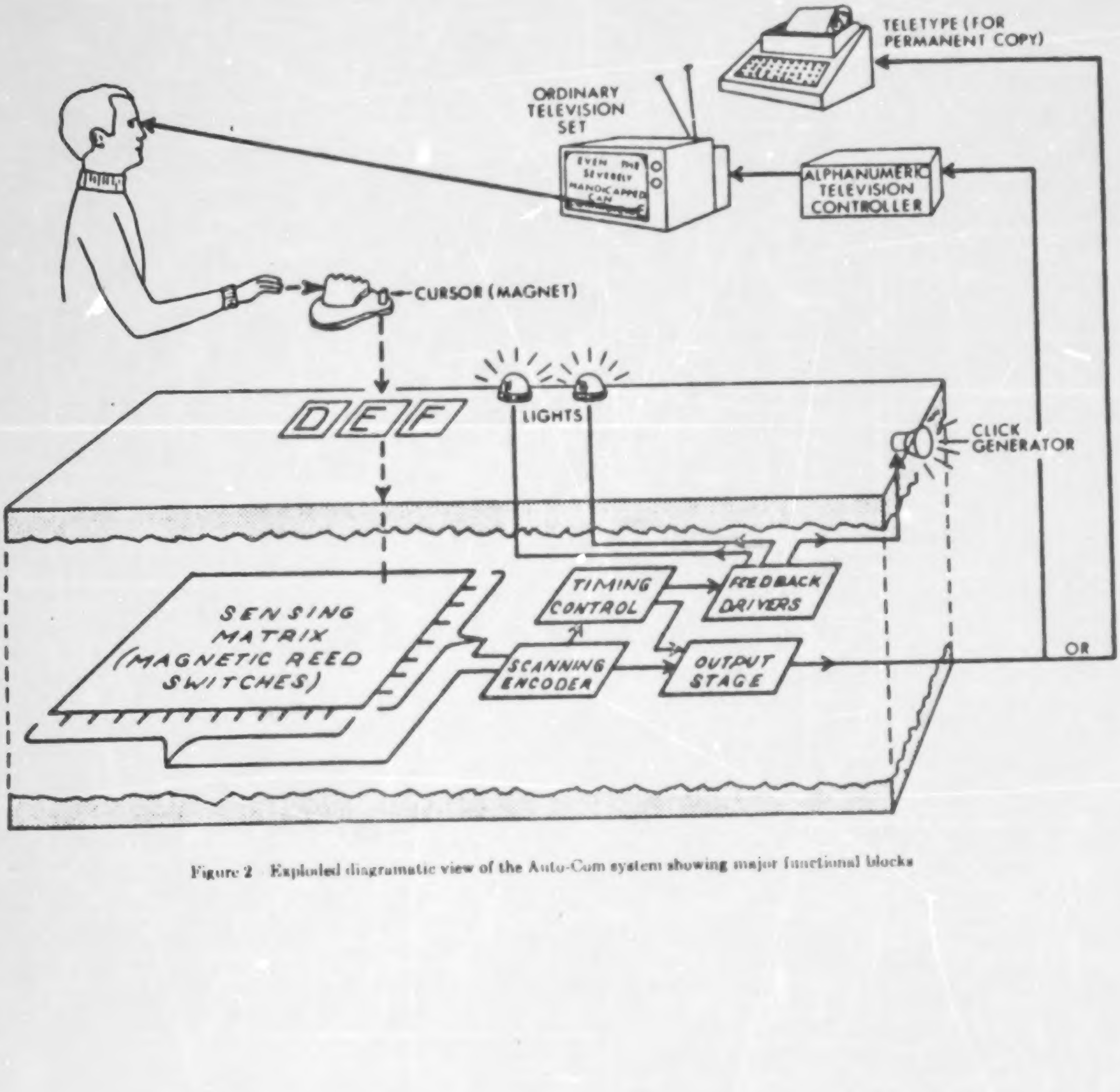

TELETYPE (FOR PERMANENT COPY)
ORDINARY TELEVISION SET
EVEN THE SEVERELY HANDICAPPED CAN
ALPHANUMERIC TELEVISION CONTROLLER
CURSOR (MAGNET)
D E F
LIGHTS
CLICK GENERATOR
SENSING MATRIX (MAGNETIC REED SWITCHES)
TIMING CONTROL
FEEDBACK DRIVERS
SCANNING ENCODER
OUTPUT STAGE
OR

Figure 2 Exploded diagramatic view of the Auto-Com system showing major functional blocks

abilities of the child. Headsticks, mouthsticks, wristbands, and fingerpieces have all been used to control the stationary Auto-Com simply by attaching the magnet to them. A wide variety of different shapes, sizes and forms of handpieces have also been used with the aid. For some individuals, a felt-bottomed handpiece has served to facilite the sliding motion over the board (see Fig. 4). For these people, the handpiece serves both to stabilize the individual's hand and to smooth and damp his motions. Other individuals are using the magnet mounted on a wristband, both for convenience and to eliminate problems due to irregular hand motion (see Fig. 5). In some cases, a single child may have several cursor systems (such as a wristband with a magnet in it and a standard slider handpiece), which he switches back and forth depending on his situation or surroundings.

Portable Auto-Com

The portable Auto-Com is operated in the same manner as the stationary model, but offers several additional features. Whereas the stationary Auto-Com must be plugged into a wall-socket to operate, the portable model is built into a special wheelchair laptray and derives its power from rechargeable batteries. The portable Auto-Com controls the same output forms (television display, typewriter and teletype) as the stationary model and offers an additional strip printer which is built into the aid (see Fig. 6). With these added features, a child is never without a means of communication.

Another added feature of the portable Auto-Com is the Wordmaster option. The surface display of the stationary model consists of a letter-symbol matrix of 84 one-inch squares. The matrix includes the alphabet, numbers, mathematical symbols, punctuation marks, and special control squares. The portable model's Wordmaster option adds a set of commonly used words to this matrix (see Fig. 7). In addition to the common words which are printed on the surface of the board, the portable Auto-Com has a snap-in memory cartridge which can be programmed with words, phrases and sentences chosen by the individual user. This option enables the portable Auto-Com to be introduced with very young children and also increases an individual's speed of communication.

B. Students

The students who participated in the Case Study Evaluation Program included seven non-vocal, cerebral palsied students. Previous communication methods employed by the students included gestures, gross pointing, limited vocalizations and, in several cases, letter or word boards.

FIGURE 4. Molded Handpiece with Plexiglass Slider.

FIGURE 5. Wristband Handpiece.

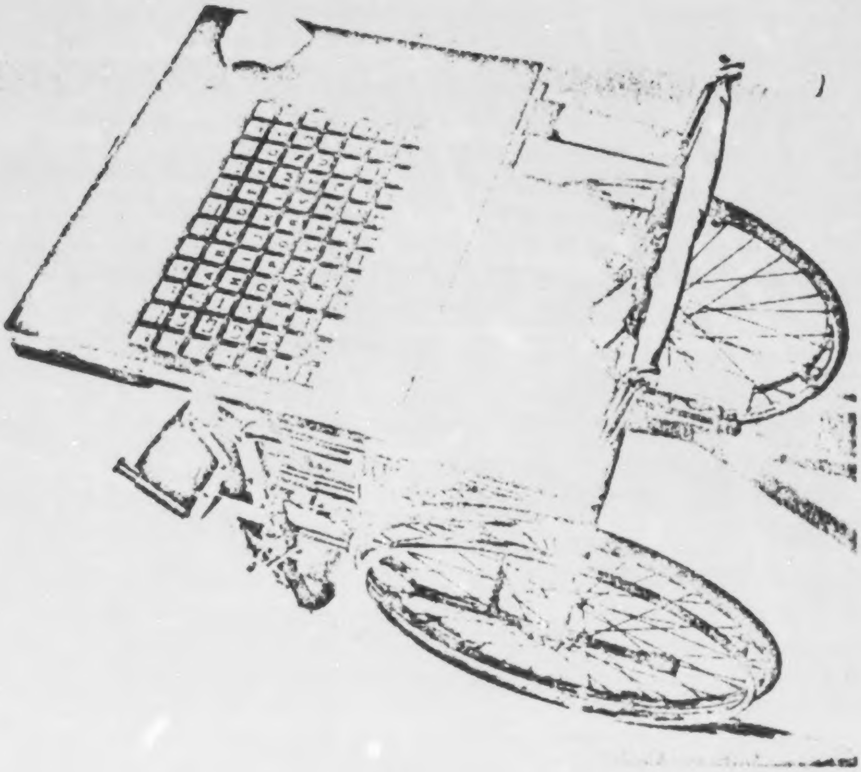
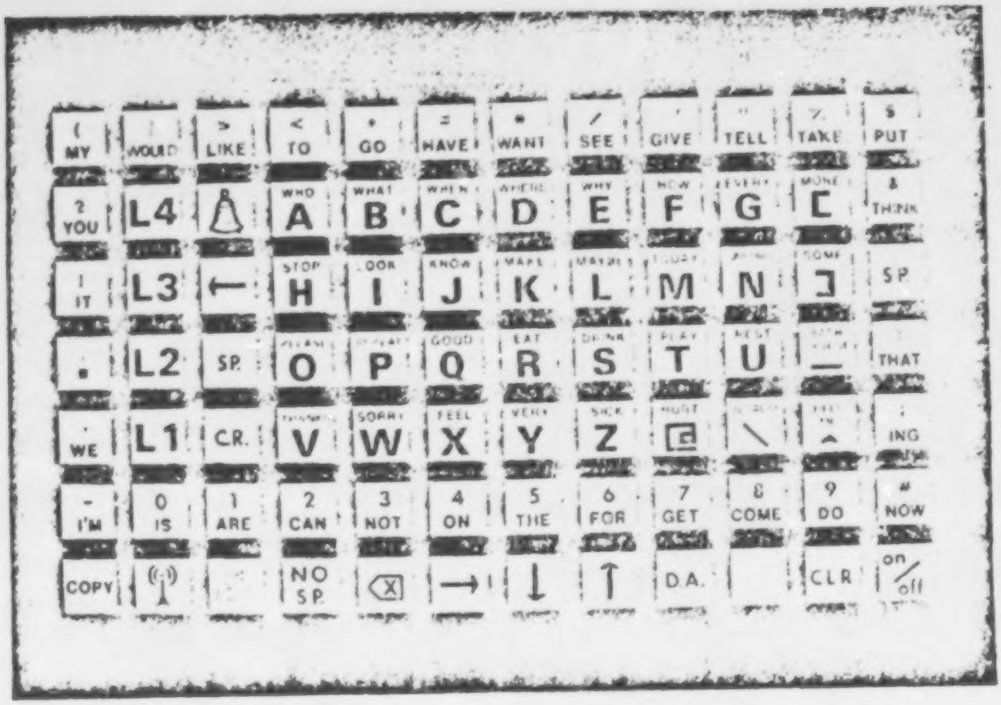


FIGURE 6. Portable Auto-Com on Wheelchair.


(MY
WOULD
> LIKE
< TO
+ GO
= HAVE
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WHO A
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- I'M
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1 ARE
2 CAN
3 NOT
4 ON
5 THE
6 FOR
7 GET
8 COME
9 DO
# NOW
COPY
NO SP.
→
↓
↑
D.A.
CLR
on/off

FIGURE 7. Letter/Word Matrix of the Portable Auto-Com.

Teachers reported that guarded or masked typewriters were also tried, but all of the students lacked adequate physical skills required to effectively use this type of aid for communication purposes. Overall, the teachers considered their student's previous means of communication to be slow, tedious and frustrating.

Prior to original selection, each student was afforded a trial use of a stationary Auto-Com to determine whether he had the physical ability to operate the aid. Judgments and observations of the student's teacher, speech clinician, occupational or physical therapist, and parents were also heavily relied upon in order to determine whether or not the student required this type of an aid and would be able to operate it effectively. A final concern of the subject selection was the desire of the student and teacher to work with a new mode of communication.

Description of Subjects

Seven of the nine students selected for participation in the 1973 preliminary evaluation program continued to participate in the Case Study Evaluation Program.

The seven students who continued in the evaluation program were non-ambulatory, cerebral palsied and lacked functional speech (see Table I). One student, S_{MM}, had limited speech, enabling her to verbalize short, intelligible utterances to individuals familiar to her. However, her speech was not functional for communicating with strangers. This student was included in the evaluation program in order to determine the usefulness of an Auto-Com system as an aid to augment partially intelligible speech and as a writing aid for this type of motorically impaired individual.

Insert Table I

The students, three males and four females, ranged in age from seven to nineteen years as of September 1974. Most of the students had been educationally diagnosed as "average or near average in intellectual ability." These diagnoses were based upon past academic records and teacher judgments. The exception was S_{KS}, who was considered "severely learning disabled."

The types of educational environments of the students included a hospital school, a public elementary school, a public junior high school, and a public high school (see Table II). Five of the classrooms were described as self-contained, special education classrooms and two as resource

TABLE I. Description of Subjects

Subject	Date of Birth	Sex	Neurological[1] Description	Previous Communication Method (prior to Auto-Com)	Type of Auto-Com Used
S_{CR}	4/17/67	F	Partial spastic, partial athetoid, able to walk with aid	Gestures and pointing, no letterboard, attempted using typewriter with one finger taped in a sling - was discontinued	Stationary
S_{KS}	10/20/64	F	Spastic, quadraplegic	Gestured by shaking head, pointing; picture and letter board	Stationary
S_{DC}	10/26/53	F	Primarily athetoid, some spasticity on left side, quadraplegic	Language board, gestures with eyes and pointing with hands	Portable
S_{CC}	11/26/58	M	Athetoid, quadraplegic	Partial alphabet board and gestures	Portable
S_{LS}	3/19/60	M	Athetoid, quadraplegic	Letter board gestures	Portable
S_{MG}	7/29/59	F	Spastic, quadraplegic, severe scoliosis problem severe ATNR	Gestures with head, poor pointing skills, number board for math	Stationary
S_{TH}	11/11/60	M	Primarily athetoid, some spasticity, quadraplegic	Letter board, gestures, some communication through vocalization	Stationary
S_{DW}	10/28/60	M	Spastic, quadraplegic, hyperflexia in upper and lower extremities	Communication through gestures, some gross vocalization	Stationary
S_{MM}	11/14/56	F	Athetoid, quadraplegic, ATNR	Language board, slight speech ability	Stationary

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[1] Descriptions were based upon neurological diagnoses provided by the staff of the University of Wisconsin Hospitals, Department of Neuropsychology and Rehabilitation, under the direction of Dr. Charles Matthews.

rooms. The types of educational programs ranged from regular education for the orthopedically handicapped to educably mentally handicapped programs. Additional supportive services which were also available to students included an occupational therapist, physical therapist, speech therapist, and, in most cases, a teacher aid.

Insert Table II

C. Evaluation Procedures and Data Collection

The data collection procedures utilized in this study were designed to obtain descriptive, investigative information relating to the interaction of each student with the Auto-Com, the use of the Auto-Com at home and school, and educational programs and curricular materials used with and/or implemented for the Auto-Com. Methods and procedures implemented included the following.

1. Systematic Teacher Feedback System

Teachers, located at the various Auto-Com field placements, served as primary observers and reporters for this program. The teachers were utilized in this capacity in order to more accurately evaluate the Auto-Com's applicability to educational environments. All but one of the Auto-Com field placements were outside the Madison area, which limited the opportunity for the researchers to directly observe classroom activities. For these reasons, a systematic teacher feedback system was developed to enhance the exchange of information between the teachers and the research group. Components of this system included formal questionnaires, classroom activity forms, periodic tracking questionnaires, taped (cassette) feedback, observational visits, and weekly phone calls.

2. Standardized Achievement Tests

The students who participated in the evaluation of the Auto-Com were administered a series of neurological test batteries. The tests were administered for the research group by the staff of the Department of Neurophysiology and Rehabilitation, University of Wisconsin Hospitals, under the direction of Dr. Charles Matthews. The purpose of these assessments was to provide comparative results for teacher-constructed tests and academic assessment measures which were under development by the research group. The test

TABLE II. Description of Educational Environments

Subject	Type of Educational Environment	Classroom Description	Type of Education Program in Classroom	Supportive Services Supportive Services
S_{CR}	Public Elementary School	Self-contained Special Ed Classroom	Multi-handicapped	Teacher Aide Occupational Therapist Physical Therapist Speech Therapist
S_{KS}	Hospital School	Self-contained Special Ed Classroom	Educational mentally handicapped + regular education for orthopedically handicapped	Teacher Aide Occupational Therapist Physical Therapist Speech Therapist
S_{DC}	Public High School	Resource Room	Regular education for orthopedically handicapped	Teacher Aide Occupational Therapist Physical Therapist Speech Therapist Homebound Teacher
S_{CC}	Public Elementary School	Self-contained Special Ed Classroom	Regular education for orthopedically handicapped	Teacher Aide Physical Therapist Speech Therapist
S_{LS}	Public Junior High School	Self-contained resource room	Regular education for orthopedically handicapped + learning disabled	Occupational Therapist Physical Therapist Speech Therapist
S_{TH}	Public Elementary School	Self-contained Special Ed Classroom	Multi-handicapped	Teacher Aide Occupational Therapist Physical Therapist Speech Therapist
S_{MM}	Hospital School	Self-contained Special Ed Classroom	Regular education for orthopedically handicapped	Teacher Aide Occupational Therapist Physical Therapist Speech Therapist

battery consisted of: Peabody Picture Vocabulary Test, Raven Progressive Matrices, Knox Cube Test, Columbia Mental Maturity Scale, Peabody Individual Achievement Test, and Boston Speech Sounds Picture Test.

3. Academic Assessment Measures

Initial work on the development of alternative academic assessment measures for non-vocal, motorically impaired students, which began during the preliminary evaluation program, was continued in this program. The activities which were undertaken during this program included a "search of the literature" and the modification of several existing tests. The tests that were modified included the Wisconsin Tests of Reading Skill Development, the Key Math Diagnostic Arithmetic Test, and the Silent Reading Diagnostic Tests #1 and #2. These modified tests were field evaluated during the second Auto-Com field test.

4. Physical Skills Assessment Inventory

Efforts to develop a physical skills assessment inventory were also initiated during this program. This inventory was to assist in the screening of future potential Auto-Com candidates. Specifically, the assessment inventory was developed to help determine the most effective interface(s) required by a motorically impaired child. The basic physical skills which the inventory was designed to assess included: range of motion, hand strength, visual acuity, speed and accuracy of movement, and pointing ability. This inventory was also evaluated during the second Auto-Com field test.

5. Parent Contact and Questionnaire

Members of the research group kept in periodic contact with parents of children involved in the evaluation program. The methods employed for parental contact were phone calls, correspondence, home visits, and a questionnaire. The purpose of these formats was to elicit parental reaction to their child's use of the Auto-Com and to physical aspects of the aid. Most of the formats utilized were kept informal, with the exception of a more formal parent questionnaire which was designed to obtain specific parental reactions to their child's use of the aid.

6. Student Newsletter

During this program, a series of student newsletters were compiled by the research group and distributed to participating students. Articles for the newsletters were supplied by the handicapped students and organized by members of the research group. The purpose of the newsletter was to provide the students with an opportunity to communicate with each other and to obtain examples of work performed by the students on the Auto-Com.

III. RESULTS -- DISCUSSION OF FIELD CENTER REPORTS

In an effort to present the results of the field test program in the most succint manner possible for this report, the data has been summarized in a descriptive manner and categorized according to educational vs. communicative use of the Auto-Com. A summary of the information will be provided as a conclusion to this section.

A. Classroom Application of the Auto-Com

During this study it was found that while in the classroom the Auto-Com was used primarily as an academic/educational aid rather than as a communication aid. According to teacher reports, this was due to the Auto-Com's facilitation of academic instruction and students' improved responses to educational programs. Teachers commented that as much as 80% of their students' total amount of classroom work involved the use of the Auto-Com. Specific educational skills taught through the use of the aid varied with each student and were primarily dependent upon skills acquired or skills which teachers assumed were acquired by a student prior to receiving the Auto-Com. Overall, these skills included: arithmetic skills (from recognition of numbers to algebraic equations), sentence construction, spelling, acquisition of reading skills, vocabulary development, comprehension skills, computer programming, and self-expression.

Academically, the Auto-Com was employed in tutorial and structured teaching, the completion of assignments and tests, classroom discussions, and, in one case, aiding limited verbal communication. Teachers commented that both the stationary and portable Auto-Coms adapted very well to existing curriculums and that fewer modifications of curriculum materials were required as compared to their previous modes of instruction (letterboards, gestures, etc.). Educational materials and programs which were successfully utilized in conjunction with both Auto-Coms included: Distar, Fountain Valley Reading System, Sound Foundations, S.R.A. Reading Series, and Ginn and Hold elementary arithmetic curriculums.

In instances where modifications were required to enhance instruction, teachers found that they were able to develop individualized instruction around the existing capabilities of the Auto-Com. One area of instruction which required adaptations involved the display of mathematical problems. To solve a simple two-digit addition problem, a student would be required to perform sixteen operations on the Auto-Com. Both the teachers and the students found this to be frustrating and time consuming. Consequently, teachers developed mylar overlays for the television display which only required the students to "fill in" the correct numbers. In another instance, a method of displaying algebraic superscripts and exponents was devised: 3C11 signified $3C^2$, 3C111 signified $3C^3$, and so forth. In addition to facilitating instruction, these adaptations furthered the students' independence.

Considering the total amount of classroom activities, students primarily used the Auto-Com for the completion of independent work. Teachers placed a great emphasis on this because for the first time the Auto-Com allowed their students to complete academic work on their own. In several cases, teachers enhanced their students' independent work by employing cassette tape recorders in conjunction with the Auto-Com. Several students received instructions from taped lessons and performed their work on the Auto-Com, thus eliminating the need for a teacher aid to read task instructions. For one student, who had visual problems which interfered with the reading of text books and curriculum materials, lessons and instructions for skill tasks were also recorded on cassette tapes. The student would listen to the tape and then perform his work on the Auto-Com, employing a large screen television for a clear visual display.

A classroom profile of typical daily routines and use of the Auto-Com within various routines appears in Table III.

Insert Table III

B. Effect of the Auto-Com upon Students' Educational Progress

Teachers reported that the educational experiences of the students in this study were greatly facilitated through the use of the Auto-Com. Prior to receiving the aid, most of the students' classroom activities were restricted by their limited ability to initiate conversations and questions. In addition, acquisition of basic educational skills had been affected by inordinate amounts of teacher time and effort required to elicit and record student responses. The introduction of the Auto-Com provided these students with their

TABLE III

Average Classroom Activities[1]				Average Hrs./Day Use of Auto-Com	Classwork Involving Use of the Auto-Com			Situations Where Auto-Com Was Used Most
Hrs./Day 1:1 instruction	Hrs./Day Group instruction	Hrs./Day Physical Therapy	Hrs./Day Other Activities		% of in-class academic work	% of class discussion	% of independent work	
2 hrs.	2 hrs.	½ hr.	1½ hrs.	4½ hrs.	80%	20%	100%	general communication, printed copy, art work, letter writing, math, playing chess
5 hrs.	2 hrs.	½ hr.	½ hr.	4 hrs.	40%	20%	100%	general communication, letter writing, art work, computer programming, tests, creative writing, playing tic-tac-toe
5 hrs.	3 hrs.	1 hr.	1 hr.	4 hrs.	80%	5%	80%	supplement other attempts at communicating (e.g. gestures), "hard copy" work, art work, letter writing
1 hr.	3 hrs.	½ hr.	1½ hrs.	3 hrs.	60%	5%	70%	math, general communication, "hard copy" work
½ hr.	4 hrs.	1 hr.	1½ hrs.	2½ hrs.	30%	5%	70%	to supplement limited verbal communication, all "hard copy" work, tests
½ hr.	3½ hrs.	½ hr.	1 hr.	1 hr.	70%	5%	80%	math, spelling and vocabulary development, supplement other attempts at communication (e.g. gestures)

first consistent and dependable means of independent communication. This was viewed by the teachers as the first step toward effective and productive educational participation for these students.

The Auto-Com enabled these students to take an active role in classroom activities by providing them with a means to produce and correct their work independently (see Fig. 8). Teachers reported that,with the Auto-Com their students were able to complete more comprehensive work which was of higher quality in less teacher time. Consequently, teachers were able to develop more detailed lesson plans and expose their students to a greater diversity of skills within various curricula. This proved to be challenging to many of the students and resulted in marked improvements in their motivation and quality of work. As one teacher remarked:

> "I think he might have had the attitude that 'Why? Nobody's going to understand me anyway.' Now S_{CC} really likes it and uses it for long periods without getting discouraged. He works long hours on the Auto-Com without getting tired."

TABLE IV. Effect upon Student's Educational Progress

Student	Learning faster & more completely	Learning faster & less completely	No effect	Learning slower & more completely	Learning slower & less completely
S_{LS}				X	
S_{DC}	X				
S_{TH}	X				
S_{CR}				X	
S_{MM}	X				
S_{CC}				X	
S_{KS}				X	

The Auto-Com's correctable visual display required the students to answer questions and to solve problems independently for the first time. As a result, teachers stated that they were able to more accurately assess their students' knowledge and progress in basic educational skills. This was especially noted in the areas of math, spelling, sentence

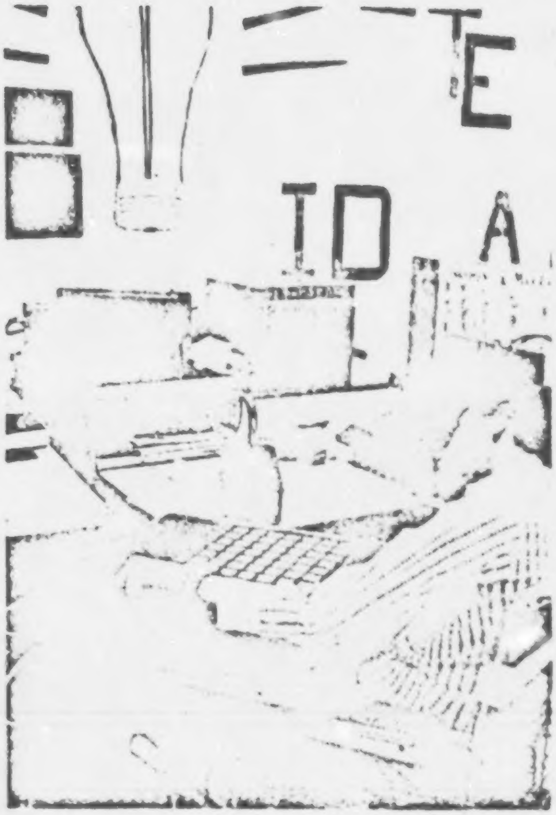


FIGURE 8. S_{CC} Using Portable Auto-Com to Complete an Assignment.

structure and reading comprehension. Prior to the Auto-Com, academic assessments were structured in a multiple choice format and were affected by "telegraphic" communication, unconscious cluing by testers, and guessing on the part of the students. Through academic assessments employing the Auto-Com, teachers discovered that students had not mastered basic concepts or processes which they had assumed the student had acquired. This was especially true in math where, prior to the Auto-Com, someone else consistently performed the operations for the students.

All of the students were reported to have progressed to some degree in the acquisition or development of basic educational skills. The Auto-Com was shown to be especially functional in facilitating the acquisition and development of math skills: two students were involved in addition and subtraction problem solving; two began multiplication and division; and two others progressed to algebra. Notable improvement in math skills progress was pointed out by teacher evaluations, math tracking quizzes, and formal assessment measures. In nearly each case of stated improvement, it was mentioned that the Auto-Com was instrumental in facilitating the progress. The ability of students to perform their own work on the correctable, visual display was considered to be the principal contributing factor to the improvements.

Improvement in spelling, sentence construction, and vocabulary development were also reflected in teacher evaluations and standardized achievement tests. Development of these skills was enhanced by the Auto-Com providing the students with their first opportunity to see and correct their letters as they formed words and sentences. As one teacher commented:

> "S_{TH} has improved 100% in writing complete sentences. He now has to write his spelling words in sentences and has to answer comprehension questions after reading in sentences. Complete sentences were never necessary before the Auto-Com, so it was difficult at first to write in complete sentences. Since using the Auto-Com, I have been able to look at parts of speech left out and work on these."

TABLE V. Skill Improvement

	SPELLING				COMPLETE SENTENCES				READING & WRITING VOCABULARY			
	no noticeable difference	somewhat	pretty much	greatly	no noticeable difference	somewhat	pretty much	greatly	no noticeable difference	somewhat	pretty much	greatly
S_{CC}				X				X				X
S_{DC}		X					X					X
S_{KS}		X			NA				NA			
S_{LS}		X				X				X		
S_{MM}	X				X					X		
S_{TH}			X					X			X	
S_{CR}			X			X					X	

Teachers considered the Auto-Com to be of tremendous value to their students' acquisition and development of educational skills. One teacher commented that, with the Auto-Com, she could teach her student in two years what normally would have taken more than three. Later she rescinded her earlier estimate and said "the increase in learning rate time was immeasureable." Overall, teachers reported that the Auto-Com's greatest effects on the student's skill progress were providing the opportunity to complete tasks independently, the elimination of costly hours of one-to-one instruction, and the opportunity for students to see and correct their work. Consequently, the students were able to spend a greater total amount of productive time in the classroom, were able to learn skill tasks in more detail, and participate in a greater amount and diversity of skills and instructional tasks (see Table VI).

TABLE VI. Degree of Independence and Teacher Time Spent

Subjects	Less independent; demands more teacher time	Same as before	Somewhat more independent; teacher time spent somewhat less	Much more independent; much less teacher time spent
S_{CC}				X
S_{DC}				X
S_{KS}	X			
S_{LS}				X
S_{MM}				X
S_{TH}				X
S_{CR}	X (in a group situation)	X (in individual work		

C. Effect of the Auto-Com upon Students' Communication Skills

The Auto-Com's major effect upon the students' communication skills has been in providing them with a means of totally expressing their thoughts and opinions without requiring a second person to interpret and translate for them. With the correctable visual display, the students were able to see what they were communicating and to correct their own mistakes. This significantly reduced the pressure students felt from taking a large amount of an individual's time to convey a message. Furthermore, the portable model of the Auto-Com, equipped with a sub-miniature strip printer[1], allowed the students to express themselves independently and privately if they wished in virtually any environmental setting. Overall, the Auto-Com provided an effective mode of response and a means of communicating with others that far surpassed the students' prior methods of communication.

The ineffectiveness of two of the communication methods previously available to the students is illustrated in Figs. 9 and 10. It was estimated that it took S_{CC} approximately three minutes to complete the communication represented in Fig. 9. This student is now able to print out sentences

---

[1] The sub-miniature strip printer records messages on a small tape.

"CRAIG"

FIGURE 9. S_{CC} Attempting to Print His Name (3 minutes).

```
G    BY  I           H    , L UH       U       Y*PI     O U
```

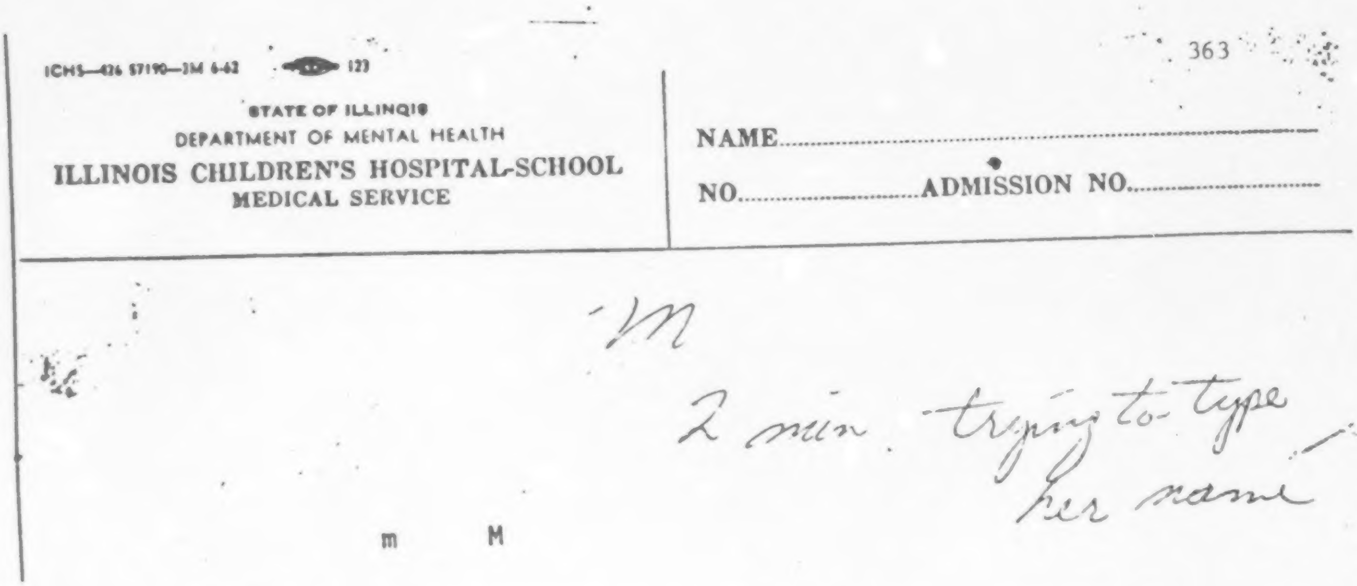
FIGURE 10. S_{CC} Attempting to Type His Name Using a Masked Typewriter (3 minutes).

such as "I com home eat wach TV 365 days nuts!" in five minutes with the Auto-Com. Figure 11 represents a two-minute attempt by S to type her name. Using the Auto-Com, this student was able to respond to a classroom question in less than five minutes by printing the following:

> "Yes, there is a difference between the price and the value of a product. The cost may be low, but if you don't need the product, it doesn't have any value. If you have been saving up for a sterio and then you see a watch that you want, you have to decide weather the watch has more value than the watch."

During this study, it was found that the students began to utilize the Auto-Com in a greater number of situations as they became more proficient in its use. At first, the Auto-Coms were primarily employed in the completion of in-class academic work, but, in most cases, they were increasingly used for expressive communication. Several of the students with portable Auto-Coms began to take their aids home and to summer camp to aid their communication with family members and friends. In addition, the portable Auto-Com's strip printer enabled students to write personal notes and letters to friends. One of the students also discovered that the Auto-Com had provided him with a totally new method of expression and quickly passed it on to the others. What he had discovered was that the Auto-Com could be used to create artwork (see Fig. 12).

The students' increased utilization of the Auto-Com for communication resulted in an important effect upon their vocalizations. A primary concern among educators and parents is that the child who has very limited speech or only a few vocalizations will stop vocalizing if provided with a communication aid. Teachers in this study have noted that the students' vocalizations increased when they began to use the Auto-Com. They felt that the use of the Auto-Com allowed the child time to complete his sentences and thoughts without having the pressure of someone constantly waiting for him to speak. This decrease in pressure helped the child to relax to communicate clear, unambiguous thoughts at his own speed. The students' vocalizations increased over time once they became aware that the transmission of their message was not solely dependent upon the intelligibility of their vocal word approximations.



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STATE OF ILLINOIS
DEPARTMENT OF MENTAL HEALTH
ILLINOIS CHILDREN'S HOSPITAL-SCHOOL
MEDICAL SERVICE

NAME...

NO.............................ADMISSION NO..............................

M

2 min. trying to type her name

m M

FIGURE 11. S_{MM} Attempting to Type Her Name Using Masked Typewriter (2 minutes).

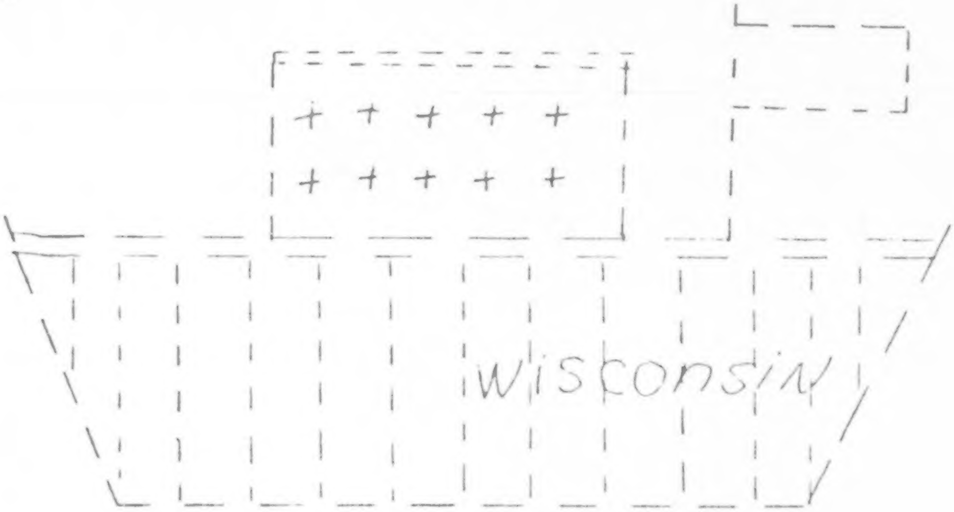

FIGURE 12. Example of Artwork Drawn Using the Auto-Com.
[Scc]

V. SUMMARY

One of the primary goals of this program was to investigate the effect of the stationary and portable Auto-Coms upon the students' acquisition of basic educational skills. Based upon teacher comments and the previous discussion, it can be concluded that both versions of the aid have had significant impact on the students who participated in this study. These students, who were previously unable to do much more than observe classroom activities, have now become active participators in their educational programs and are able to produce evidence that they are quite able to think, to learn and to communicate.

As a general teacher reaction, both Auto-Coms were considered to be of significant value in helping the students acquire and develop basic skills. Teachers were able to instruct students in a more direct and less time-consuming manner. In addition, they were able to spend greater amounts of productive time with each student. Teachers commented that one of the most exciting features of the Auto-Com was its ability to allow for accurate assessment of the student's competencies and deficiencies.

The Auto-Com was reported in nearly all cases to give students personal satisfaction and motivation to learn. This was especially noted with the portable Auto-Coms. Students using this aid were able to communicate in virtually any environment for the first time, and expressed strong desire to do so. The Auto-Com has also had effects on the social and personal development of the students. Teachers and parents report that the children are expressing their own opinions now and taking on a more active role in family relations.

Other important findings reveal that rather than decreasing vocalizations which may have been used as previous means of communication, these vocalizations have been observed to increase.

In comparing the stationary and portable models of the aid, three primary features were shown to be significant to successful use of the Auto-Com and integration of it into the school and home lives of the students. These three features were:

(1) independence,
(2) visible, correctable display, and
(3) portability.

Nearly all teachers and parents commented upon the Auto-Com's ability to free their time and to allow students to complete work on their own. Teachers were able to spend more productive hours with students, and parents were more free to carry out daily family activities once the burden of spending many hours of translating their children's messages was relieved from their schedules. The students were then able to complete work at their own pace without constant supervision and were thus given both privacy and the ability to communicate under less pressure and time constraint.

The visible, correctable display was shown to be of significant importance in the students' development of basic communication and vocabulary skills. They were, for the first time, able to see their letters form words, and words form sentences, and could correct and change their output until it appeared as the final product they desired. Because students were able to do this, teachers and parents were able to more accurately view the learning processes which the students were going through prior to writing a message or performing a math problem.

Portability was an important feature for communication. Preliminary studies showed that to be successful as an augmentative "voice" for the child, it had to be able to be easily transported with the child into virtually any environment. It was noted during this study that those students using portable Auto-Coms used their aids during more total hours of the day and that they completed more independent work with these aids than those students using stationary Auto-Coms. It was also noted that students using portable aids participated in a greater percentage of class discussion than those students using stationary aids.

As a result of direct observation and parent, teacher and child reaction, it has been shown that, while both versions of the aid were of significant importance in the development of basic educational skills, the portable Auto-Com was seen as a more effective communication aid in that it allowed the child to communicate wherever he went in his wheelchair rather than confining his communication to a stationary study carroll or desk.

The results of this study are encouraging and point to the need to develop and implement effective communication modes for severely handicapped children. While the Auto-Com was the aid used in this particular study, it is felt that many of the results noted would have occurred with the use of other types of aids, as they are directly related to providing the students with their first effective means of communication. The overall effect of providing effective communication has been demonstrated here along with effects specifically the result of certain features of the Auto-Com.

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APPENDIX I

Field Test Report - Toilet Training: How to Teach Your Developmentally Delayed Child Handwashing and Other Related Toileting Skills: How to Teach Your Developmentally Delayed Child

Field Test Report

TOILET TRAINING: HOW TO TEACH YOUR DEVELOPMENTALLY DELAYED CHILD

and

HANDWASHING AND OTHER RELATED TOILETING SKILLS: HOW TO TEACH YOUR DEVELOPMENTALLY DELAYED CHILD

by

Deidre Gollop

The University of Wisconsin
Research and Development Center

September 1977

On August 27, 1976 the National Center on Educational Media and Materials for the Handicapped (NCEMMH) presented Specialized Office Three (SO3) with the content evaluation that they had completed on Here We Go (see Appendix A). As this evaluative data lacked substance, a search was made by SO3 for additional extant evaluative documents on the product. Data was secured from the original authors of the program and from Dr. Wayne Lance, Director of the Northwest Regional Special Education Instructional Materials Center, where Here We Go was originally written. This data provided documentation on the need for the product, identified the target population, and expanded on the objectives of the material (see Appendix B).

A search began immediately for an evaluator to work with the content expert at SO3 (see Appendix C). This individual was to act as a consultant in constructing field test instruments, and in collecting and collating the data from the field tests.

On October 20 an evaluator was chosen (see Appendix C).

Concurrently, a decision had been reached at SO3 that the extant evaluative data did not give substantive criticism and direction to the program being adapted. The need for such direction had become evident during the first revision of the text when the content analyzer found there was reason for substantial doubt that the objectives of the program as developed would make a significant change in the learning of the target audience. For this reason, the first decision made with the program evaluator was to seek the expertise of professionals in the field and consider this a developmental evaluation of the product. A formal field test involving parents and children would follow the developmental test. Field validators were selected (see Appendix C), a field validation instrument was designed (see Appendix D), and on November 26 this instrument was disseminated in a meeting with the professionals involved along with the text which had been revised for the developmental field test.

At this time a proposal was submitted to the Madison Public Schools for clearance to use a population in the school system for the formal field test (see Appendix E). The proposal was approved, but on meeting with the administrator of the potential field test population, it was found that no members of the target population were presently being toilet trained. The search continued and contact was established with approximately 30 other populations.

On February 7 the results of the professional evaluation were received, reviewed and collated. A third revision of the program was begun to incorporate numerous suggestions which had a high frequency of occurrence in the comments of the professionals completing this developmental field test. A summary of their comments appears in Appendix F. The actual validation texts can be located in the artifact box for the toilet training program. The major thrust of these remarks was to expand the program in greater detail and to reduce the vocabulary level in order to meet the needs of the parents who were to direct our target group. The parents would be directing developmentally delayed and mildly physically handicapped youngsters. These parents on an average respond most appropriately to a fifth grade reading level.

Immediately following the synthesis of the developmental data, meetings were held with the S03 content expert and the evaluator to construct the format field test instrument.

Simultaneously, a synopsis of the toilet training program and specification of their test needs were sent to all groups who expressed an interest in being established as a field test population (sample appears in Appendix G).

A decision was made to break the field test instrument into two parts — an initial instrument and a final instrument. The rationale for this approach was to heighten the level of reliability and validity by asking questions of a similar nature in both instruments and doing a cross check to see if the answers were parallel. Another goal of two separate instruments was to be able to see if the expectations stated on the first instrument were actually achieved as recorded on the final.

Field test populations were identified by March 22, 1977. Three children were located by the Area Learning Resource Center (ALRC) in Maine, one by the A.L.R.C. in New Jersey and nine by the Marquette-Alger Intermediate School District in Michigan.

The initial field test instrument was disseminated to these groups immediately. The final field test instrument was forwarded after an appropriate time lapse. Constant contacts were made with the field test cities by phone during the time the test was administered were continual. The purpose of the ongoing communication was to answer any questions from the professionals and families involved and to check on progress (see Appendix H).

By May 10, 1977 all of the field test data that S03 could collect was analyzed and the fourth and final revision of the toileting program was begun. The collation of the formal field test data produced the following findings:

13 participants were initially committed to begin the field test
5 participants completed the field test
  2 (twins) where one child was normal and the other developmentally delayed with some physical problems
  1 child with brain injury
  2 children for which information on the handicapping conditions was not available
  1 participant in the group of 5 returned the toilet training schedules as requested
8 did not finish
  1 mother felt she should not toilet train until summer
  1 family left the area
  2 (twins) became toilet trained before the program was initiated
  1 child became ill and the mother of this child was pregnant so decided to postpone the training
  2 (twins) did not finish as the mother was still working on training 1 twin and had not had time to even start the other
  1 child was having medications adjusted and was not responsive
  3 people in this group of 8 sent in final data even though the test was not complete -- These three include 1 child who was developmentally delayed and twins with brain damage and cerebral palsy.

Of the 5 participants who actually completed the field test, only 1 child was completely trained by the time that the final data was submitted. The only schedules which were returned record this child's behavior. Other children had made significant gains but were not completely trained.

Although much information was gleaned from the field test, there was definitely not sufficient data to state that the toilet training program can be proven to influence the toileting behavior of developmentally delayed and mild physically handicapped preschoolers. The field test did show that parent enthusiasm is a key factor in toileting success, that knowing a child's toileting schedule is very important and only becomes obvious when written down, and that a straight-forward format emphasizing clarity and brevity is vital to the comprehension of the parent trainers.

The fact that the field test did not produce the learner change that was hypothesized is not considered by the evaluator of the program to necessarily be a problem with the philosophical content of the program but rather with strategical variables beyond the control of Specialized Office Three.

The ability to conduct a field test locally is vital to ensure the validity and reliability of data and SO3 was unable to locate a population locally who could toilet train in the time period essential for our rigid timeline. The result of field testing from afar with groups who agreed to be field test populations as a professional favor is that there was a lack of follow-up in parental administration of the program and incorrect procedures implemented in training. Furthermore the lack of commitment to the program on the part of distant agencies who volunteered to help out resulted in field test instruments which were not filled out completely and some which were not done correctly.

The rigid timeline also greatly reduced the length of time desired for field test implementation and many parents expressed the view that they needed more time to work with the program or that they would like to use the program but felt that they must postpone doing so for a short period.

If S03 could have had the advantage of an extended time line field test populations could have been selected locally and this would have effected both the quantity and quality of the results.

The reason why S03 was not able to locate a population locally is that the timeline was functionally inflexible. On the one end of the time spectrum the program had to revised and developmentally field tested before going to a formal field test and on the other end of the continuum the final date by which the product had to be to the National Center for marketing and distribution was June 1. This time wedge placed the formal field test in the end of winter which was the worst possible time for the content matter S03 was to field test in a geographical region noted for severe weather. Parents and teachers in Wisconsin do not toilet train at this time of the year because it is simply too difficult to check for wetness and undress a child to use a toilet with layers of winter garb.

One final pitfall which greatly clouded the test for learner effectiveness in relation to the toilet training program is that the nature of the developmental field test as envisioned in the initial timeline of Adaptation 1 Dissemination Responsibilities decided on jointly by NCEMMH and SO3 (see Appendix J) was disregarded. The developmental field test was to be a test of the product with a small sample of developmentally delayed and physically handicapped preschoolers. However, due to the fact that the level of professional evaluation presented to SO3 by the National Center was totally inadequate (see Appendix A), and due to the fact that there was neither time nor funds to support both another professional review and the small sample field test, the decision was made to go with a thorough professional review and then postpone the try-out with the target population until the final fieldtest.

The fact that the National Center was not able to construct a meaningful evaluative document and the fact that the sample of professional expertise they presented was minimal may suggest that the field evaluation of a product should be done by the office doing the substantive content work. The professionals involved with the product have a heightened awareness of the type of questions which are appropriate to ask about a product and therefore can draw up a meaningful instrument. The basic instrument passed on to SO3 from NCEMMH was not sophisticated enough to answer the most relevant questions about the product. The office doing the content revision also knows from both a study of the product and the required review of the literature the professionals to engage in such an evaluation to glean the most significant results.

The fact that SO3 had to duplicate efforts in the area of the professional evaluation cost a great deal of time and money. Not only did the product not receive a thorough evaluation, but also one revision of the program had already been completed before the need for the repetition of the grass roots evaluation became clear.

It would seem advisable before embarking on an adapt effort to have some preplanning time in order to not only complete a thorough review before making the decision of whether to move ahead, but also to have the time to be able to pinpoint the population needs for the field test, search for such a population locally and think about whether the timing of the field test is relevant to the testing of the product. An ideal recommendation would be to have one year for planning before embarking on the substantive adaptation of a product.

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Directives - Consultant Evaluation

Following are a list of cue questions to be used for referral while reviewing the text.

Structure your response in two ways:

1. Use the questions for continual referral while doing a page by page examination of the text. In this stage, please make "on text" suggestions, modifications, evaluation by simply jotting the number of the cue question next to the relevant section and listing appropriate comments.

2. Having reviewed the entire booklet, page by page, please make general comments on separate pieces of paper. These comments can be in outline form or written as a free style narrative. The purpose of these remarks will be to enlarge specific comments noted in the text, to clarify your professional opinion regarding the approach and to summarize opinions. In this section, please address the following specifically:

    A. Comment on whether you see a need for a program of this type by parents and/or by teachers.

    B. Comment on the quality of the booklet.

    C. Address the estimated effectiveness of the approach.

    D. Note any other programs which you feel have a similar approach.

    E. List any major problems that haven't been handled in the text.

    F. Comment on whether you feel the program merits a developmental and formal field test.

3. Should the text require such, do a sketch of any major reorganizational elements needed.

Cue Questions:

1. Where would pictures or visuals help to clarify the text? Are there any spots where proposed pictures seem un-necessary to compliment the content?

2. Are the examples of other childrens' schedules helpful?

3. Do you have more suggestions to add to the checklist of remedies?

Directives - Consultant Evaluation
Page -2-

4. Is the task sequencing in the program done appropriately? Is this task analysis at all similar to the approach with which you have been successful?

5. Is the program detailed with sufficient clarity for use by teachers? By Parents? Are the directions clear? the explanations? Are there any major problems encountered in toileting which are not covered?

6. Are there modifications which could be made to make success with this program an easier goal?

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263-6587

March 29, 1977

MEMORANDUM

To: Margorie Damato

From: Deirdre Flannery Gollor

Re: Plan for the Field Test Evaluation of TOILET TRAINING: HOW TO TEACH YOUR DEVELOPMENTALLY DELAYED CHILD

You will be receiving two questionnaires. The first is enclosed and is to be filled out and returned as soon as possible. The other will be forwarded April 1 and is to be completed at the end of the field test.

Both questionnaires have sections to be completed by the person responsible for administering the field test and by the parents. The administrator may work with the parents to help them complete their section. In addition, the administrator may have to acquire some information from the parents in order to complete her/his section.

The enclosed questionnaire should be mailed at your earliest convenience in the stamped, pre-addressed envelope provided for this purpose. If you have any questions about the questionnaire or are having any difficulties implementing the field test please feel free to call me collect at (608) 263-5997.

ja

Enclosures (3)

[redacted]

263-6587

March 29, 1977

MEMORANDUM

To: Margorie Damato

From: Deirdre Flannery Gollop

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The enclosed questionnaire should be mailed at your earliest convenience in the stamped, pre-addressed envelope provided for this purpose. If you have any questions about the questionnaire or are having any difficulties implementing the field test please feel free to call me collect at (608) 263-5997.

ja

Enclosures (3)

THIS DATA IS TO BE COMPLETED AT THE START OF
THE FIELD TEST BY THE PERSON RESPONSIBLE FOR
ADMINISTERING FIELD TEST PROCEDURES

QUESTIONS RELATING TO FIELD TEST SUBJECT:

1. What is the child's chronological age? _____ years, _____ months.

2. What is the child's mental age? __________

3. What is the nature of the child's handicap or disability?

   _____ Developmental _____ Physical _____ Other

   Briefly describe any pertinent diagnosis or diagnoses.

4. Has the child been in another toileting program?

   _____ Yes _____ No _____ Do not know.

   Briefly describe the nature of prior toilet training for this child.

5. How long have you worked with the child? __________ months.

6. How cooperative is the child?

   _____ Very cooperative.
   _____ Somewhat cooperative.
   _____ Neutral.
   _____ Somewhat uncooperative.
   _____ Very uncooperative.

   Please comment.

7. Please complete this table.

	Record # of HITS per day	Record # of MISSES per day	Use observable descriptors to explain child's actual behavior at beginning of field test and child's expected behavior at end of field test.
CURRENT PERFORMANCE LEVEL (status before the start of the field test:)			
ESTIMATED PERFORMANCE LEVEL (at end of field test) If the child progresses MUCH LESS THAN EXPECTED (status at the end of the field test:)			
If the child progresses somewhat LESS THAN EXPECTED (status at the end of the field test:)			
If the child progresses as EXPECTED (status at the end of the field test:)			
If the child progresses MORE THAN EXPECTED (status at the end of the field test:)			
If the child progresses MUCH MORE RAPIDLY THAN EXPECTED (status at the end of the field test:)			

QUESTIONS REGARDING THE TOILET TRAINING PROGRAM

1. How easy was it for you to understand the program?

_____ Very easy.
_____ Easy.
_____ Neutral.
_____ Hard.
_____ Very hard.

Please comment on both easy and hard things for you to understand. Give examples:

2. How easy was it for you to explain the program to parents?

_____ Very easy.
_____ Easy.
_____ Neutral.
_____ Hard.
_____ Very hard.

Please comment.

3. How useful, in your opinion, is the chart, "Toilet Training Schedule"?

_____ Very useful.
_____ Somewhat useful.
_____ Useless.
_____ Very useless.

Please comment.

4. How much did the parents appear to understand the tasks they must perform?

_____ Very much understanding.

_____ Much understanding.

_____ Some understanding.

_____ Little understanding.

_____ Nearly no understanding.

Please explain your rating.

THIS SECTION IS TO BE COMPLETED BY
THE CHILD'S PARENTS. THE FIELD TEST
ADMINISTRATOR MAY HELP PARENTS ANSWER
THESE QUESTIONS IF NECESSARY

1. When does your child tell you that he or she needs to use the bathroom?

_____ Before he or she needs to go.
_____ During the time he or she is going.
_____ After he has had an accident.
_____ My child does not tell me and I find out for myself.

If he does not tell you, how do you find out about his or her need to go?

2. What kind of rewards does your child like?

3. Which rewards do you plan to use?

4. Do you think this toilet training will fit in with your other activities?

_____ Yes
_____ Probably.
_____ No
_____ Can't tell yet.

What problems do you expect in trying to fit the program in with your other activities?

5. Do you plan to have anyone else help you train your child?

_____ Yes _____ No

Is this other person or persons part of

_____ A school?
_____ A day care center?
_____ A babysitter?
_____ A friend?
_____ A member of the family?
_____ Other, please describe:

6. Did you have any difficulty in adapting the toilet or potty chair?

_____ No _____ Yes, please explain

7. Did you have to fix up the bathroom?

_____ No _____ Yes, please explain below:

_____ We added a stepping stool.
_____ We fixed the floor.
_____ We added straps or bars for handholds.
_____ We widened the door.
_____ We did these other things too:

8. Describe where you put the TOILET TRAINING SCHEDULE.

9. Are you ready to use the TOILET TRAINING SCHEDULE?

_____ Very ready.
_____ Somewhat ready.
_____ Not sure.
_____ A little unready.
_____ Very unready.

10. Please write out any questions which still need to be answered and we will answer them by return mail.

Please put this questionnaire in the stamped, pre-addressed envelope provided for this purpose. Any questions that you note on the form will be answered and the answers forwarded to you within a week.

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the University of Wisconsin · 1025 West Johnson Street · Madison, Wisconsin 53706 · (608) 263-4200

263-5997

April 1, 1977

MEMORANDUM

To: Marjorie Damato

From: Deirdre Flannery Gollop

Re: Post Field Test Instrument

You will note that there are two sections to the questionnaire. One section is to be completed by the person who is responsible for administering the field test. The other is to be completed by the parents. The administrator may work with the parents to help them complete their section.

The enclosed questionnaires should be forwarded to Specialized Office Three by April 29. Please include with them the accumulated toilet training schedules. Please send it Air Mail Special Delivery in the self addressed envelope provided and submit a bill for your mailing costs.

If you have any questions about the instrument you have my number and I'm always happy to lend assistance.

ja

[redacted]

263-5997

April 1, 1977

MEMORANDUM

To: Marjorie Damato

From: Deirdre Flannery Gollop

Re: Post Field Test Instrument

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If you have any questions about the instrument you have my number and I'm always happy to lend assistance.

ja

THIS DATA IS TO BE COMPLETED AT
THE END OF THE FIELD TEST BY THE
PERSON RESPONSIBLE FOR ADMINISTERING
FIELD TEST PROCEDURES

THESE QUESTIONS ARE ABOUT THE CHILD WHO IS THE FIELD TEST SUBJECT

1. Refer to the table in question 7 which was filled in at the start of the field test. How much did the child meet expectations?

_____ MUCH LESS THAN EXPECTED.
_____ LESS THAN EXPECTED.
_____ EXPECTED.
_____ MORE THAN EXPECTED.
_____ MUCH MORE THAN EXPECTED.

Please provide your opinion as to why this rating occurred.

2. Please describe the CURRENT status at the end of the field test in terms of:

# of HITS per day __________

# of MISSES per day ________

Describe the child's toileting behavior:

3. Disregarding any progress or lack thereof, how comfortable was the child with procedures involved in the toilet training program?

_____ Very comfortable.

_____ Comfortable.

_____ Neutral.

_____ Uncomfortable.

_____ Very uncomfortable.

Please explain.

FILL IN THIS QUESTIONNAIRE:

Section of Program	Clearness of Explanation	Comments for Improvement
Before You Begin (pages 2 & 3)	_____ Very clear _____ Somewhat clear. _____ Okay. _____ Somewhat unclear. _____ Very unclear	
Get Ready (pages 4-18)	_____ Very clear. _____ Somewhat clear. _____ Okay. _____ Somewhat unclear. _____ Very unclear.	

Section of Program	Clearness of Explanation	Comments for Improvement
Get Set (pages 19-25)	_____ Very clear. _____ Somewhat clear. _____ Okay. _____ Somewhat unclear _____ Very unclear	
Here We Go (pages 26-45)	_____ Very clear. _____ Somewhat clear. _____ Okay. _____ Somewhat unclear. _____ Very unclear.	

Section of Program	Clearness of Explanation	Comments for Improvement
Keep Going - Ten Related Skills (pages 45-66)	_____ Very clear. _____ Somewhat clear. _____ Okay. _____ Somewhat unclear. _____ Very unclear.	
One Last Skill - Handwashing (pages 66-93)	_____ Very clear. _____ Somewhat clear. _____ Okay. _____ Somewhat unclear. _____ Very unclear.	

THIS DATA IS TO BE COMPLETED
AT THE END OF THE FIELD TEST BY
THE CHILD'S PARENTS

1. Do you feel that the toilet training went as well as could be expected?

_____ Yes _____ No

Please explain why:

2. Did you give up doing the toilet training program part way through?

_____ Yes _____No

If yes, please write down the page number you ended on ____________.

Please try to explain why you thought it best to give up the toilet training program.

3. Did you use some of the adaptive techniques listed in the manual?

_____ Yes

Which ones?

_____ No

What other ones did you use, if any?

4. Did you find the TOILET TRAINING SCHEDULE useful?

_____ Very useful.

_____ Somewhat useful.

_____ Not useful.

_____ Did not use it at all.

Can you explain how to make the TOILET TRAINING SCHEDULE more useful?

5. How well did the toilet training program fit into your other activities?

_____ Fit in very well.
_____ Fit in okay.
_____ Hard to tell.
_____ Some problem in fitting in.
_____ Didn't fit in at all.

6. Were you comfortable doing the toilet training program?

_____ Very comfortable.
_____ Comfortable.
_____ Uncomfortable
_____ Very comfortable

Please explain the ways you were comfortable or not.

7. Did you find any of the Suggestions to Ensure a Regular Schedule (on pages 36 to 41) useful?

_____ Many of them were useful.
_____ Some of them were useful.
_____ A few of them were useful.
_____ None of them were useful.

Will you explain which ones were useful?

(question 7 continued)

(question 7 continued)

Can you make any suggestions which were not in the program?

8. Disregarding any progress or lack thereof, how comfortable was the child with procedures involved in the toilet training program?

_____ Very comfortable.
_____ Comfortable
_____ Neutral.
_____ Uncomfortable.
_____ Very comfortable.

Please explain.

9. Were the directions for teaching your child to be regular clear enough for you to use?

_____ Very clear.
_____ Somewhat clear.
_____ Okay.
_____ Somewhat unclear.
_____ Very unclear.

Please give some examples of what was unclear.

10. Was your child able to learn to approach the toilet properly? ____Yes ____No
Was your child able to learn to undress appropriately? ____Yes ____No
Was your child able to learn to get on the toilet? ____Yes ____No
Was your child able to learn to take paper from the roll? ____Yes ____No
Was your child able to learn to wipe properly? ____Yes ____No
Was your child able to learn to drop the paper in the toilet? ____Yes ____No
Was your child able to learn to get off the toilet? ____Yes ____No
Was your child able to learn to dress after going? ____Yes ____No
Was your child able to learn to flush the toilet? ____Yes ____No

11. Were the directions for teaching your child related skills like approaching the toilet, wiping, flushing, dressing and undressing clear enough for you to use?

_____ Very clear.
_____ Somewhat clear.
_____ Okay.
_____ Somewhat unclear.
_____ Very clear.

Please give some examples of what was not clear.

12. Were you able to teach your child how to wash hands?

_____ Yes _____ No

13. Were the directions for teaching your child to wash hands clear enough for you to use?

_____ Very clear.
_____ Somewhat clear.
_____ Okay
_____ Somewhat unclear.
_____ Very unclear.

Please list some of the things which were not clear.

14. What is the next thing you are going to try to teach your child about going to the toilet?

15. Are there any other things you want to say about the toilet training program?

16. Do you have any questions we can try to answer?

APPENDIX J

Programming for the Severely Handicapped: Presentation Evaluation Form

Workshop on Materials for the
Hearing Impaired and the Severely,
Profoundly, and Multiply Handicapped

October 11, 1976
PROGRAMMING FOR THE SEVERELY HANDICAPPED
Presentation

Specialized Office for the Deaf and Hard of Hearing
Lincoln, Nebraska

PRESENTATION EVALUATION FORM

Personnel Information

SEX: 8 Male 15 Female

AGE: 5 20-29 12 30-39 2 40-49 3 50-59 ___ 60+

Agency represented: See list below.

Present position: ____________________

Specific responsibilities: ____________________

Agencies represented:

Alabama LRC
ALRC # 3
ALRC # 9 (3)
California ALRC (2)
GALRC #6
Illinois ALRC # 7
Indiana ALRC
Indiana DPI
MALRC - DPI
Margaret Sterck School (DE)
Midwest ALRC (Iowa)
NEALRC
NCEMMH (2)
Pennsylvania ALRC
SELRC
Texas ALRC # 5 (3)
Dr. U. E. Zambarano Memorial Hospital

Our presentation is divided into a number of sections. So that we may continue to improve our efforts, we would greatly appreciate it if you would take a few moments at the conclusion of each section to provide an assessment of that specific section, including recommendations we might wish to consider. Thanks.

Directions: Please check a position on the scale between each pair of adjectives that best summarizes your feelings & attitude about the specific section which was presented.

INTRODUCTION

Functional	3	10	2	6				**Nonfunctional**
Bad				8	3	4	3	**Good**
Valuable:	4	5	5	7				**Worthless**
Clear	4	5	7	3	2			**Unclear**
Irrelevant			1	7	3	3	7	**Relevant**

Specific Recommendations:

ASSESSMENT GUIDES

Unclear			2	5	2	5	7	**Clear**
Irrelevant					4	7	10	**Relevant**
Valuable	8	6	4	2	1			**Worthless**
Functional	7	6	3	3	1			**Nonfunctional**
Bad			1	4	2	7	4	**Good**

Specific Recommendations:

INSTRUCTIONAL - BEHAVIORAL OBJECTIVES, TASK ANALYSIS

Unclear	2	1	1	3	3	7	6	**Clear**
Relevant	11	6		3	1	1		**Irrelevant**
Nonfunctional			1	1	5	6	9	**Functional**
Good	6	8	3	3		1		**Bad**
Worthless				3	4	9	6	**Valuable**

__Specific__ Recommendations:

SKILL ACQUISITION OUTLINE

Valuable	5	6	4	3	2	1		**Worthless**
Nonfunctional		1	2	4		8	6	**Functional**
Bad		1		4	6	4	4	**Good**
Relevant	7	4	3	3	2	2		**Irrelevant**
Clear	6	10	2	2		1		**Unclear**

__Specific__ Recommendations:

VISUALS, DISPLAYS, HANDOUTS, RESOURCES

Irrelevant		1		1	1	10	10	**Relevant**
Worthless					1	12	9	**Valuable**
Clear	11	7	2		2			**Unclear**
Nonfunctional			1		4	8	9	**Functional**
Good	7	6	8					**Bad**

__Specific__ Recommendations:

SUMMARY EVALUATION

"In general, I think today's presentation was..."

Organized	10	8	1	2	1	1		Disorganized
Meaningless			1	2	4	12	4	Meaningful
Useless				4	3	12	4	Useful
Hard		2	1	6	2	7	2	Easy
Interesting	4	8	6	3	1	1		Boring
Slow		1	1	6	4	7	5	Fast
Clear	4	10	5	3		1		Unclear
Sufficient	3	3	5	5	3	3		Insufficient
Valuable	5	10	5	2		1		Worthless

Please indicate your overall reaction to the presentation by placing an "X" at an appropriate point along the scale below; thank you.

2 1 1 2 4 4 5 4
NR 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 2

Poor Fair Good Excellent

Finally, we would like you to respond to the following questions, if you would, please:

1. What was your reason for attending this presentation?

2. What did you like LEAST about the presentation?

3. What did you like BEST about the presentation?

Any additional comments:

Again, many thanks for taking the time to help us in our own efforts to improve...

Charles Hedberg
Carole H. Price

Presentation

Workshop on Materials for the
Hearing Impaired and the Severely,
Profoundly, and Multiply Handicapped

Specialized Office for the Deaf and Hard of Hearing
Lincoln, Nebraska
October 11, 1976

Unedited List of All Participants' Comments

INTRODUCTION

Evaluation itself: all positive items should be at one end of the scale. This way is confusing for filling out & for tallying. There's no way to obtain a meaningful mean or median score with this scale.

Too much at once. Stop talking about slowing down and do it!

Started out with great expectations.

Make complete set of materials available at time of presentation.

Did not attend in the a.m.

Was not present.

Charlie: Video tape one of your presentations for self analysis of your eye and hand behaviors. They are much more distracting than rapid speech.

Objectives for the day became less clear - until the end of the day - turned out ok.

1. Do not present overhead materials that are not in packets. I am writing the content of overhead materials while I should be taking notes on specific items.
2. Check your facilities before presentation. You were in front of overheads most of presentation.
3. Good content.
4. Have all your handouts numbered so presentation can be more organized in references.
5. Smoking during presentation is offensive to me.

ASSESSMENT GUIDES

(1) Transparencies could be arranged in order prior to presentation, thus eliminating a lot of stop/start - opening/closing binder to find the next transparency.
(2) Don't stand in front of overhead - transp. can't be seen.
(3) Talk too fast.

You cannot smoke and speak at the same time. (Very distracting!)

Slow down presentation, please!!

Expand on each instrument. Too condensed.

That Charles be less condescending

Annotations would help describe the guides; if possible, an indication of the span of developmental line would be helpful.

Items on transparencies should be available as handouts.

Suggest that all sheets be available - too much flipping back & forth necessary.

This cannot really be assessed in terms of the presenter's ability since the work of other people was shown; therefore the above rating is for the products shown.

Suggest binding materials for easier use.

Have copies of these assessment materials available where possible.

Have copies of assessment guides in each packet. Have all overheads in packet (copy of, that is)

Would be most helpful to include copies of missing overheads in our packets.

Not attend in the a.m.

Was not present.

Much too fast, resulting in superficial treatment of the subject. I would prefer to have fewer topics covered, but in more depth.

INSTRUCTIONAL-BEHAVIORAL OBJECTIVES, TASK ANALYSIS

Behavioral objectives - ok. Task analysis was vague and less clear. On next form please separate the two.

Excellent.

Is there some way in which could be involved in activities - rather than a passive listening activity?

Discussion of task analysis dragged on far too long. You should just make the point that there's lots of flexibility and try not to let all the picky disagreements dominate.

Number or code each handout - You flip them on - the participants shuffle and we've lost 18 paragraphs!

I would recommend that you present more than one sequence at a time, more than one type of break down. Also include more basic skills that really severely involved kids would be taught. I.e., teaching my kids to adjust water temperature would keep me & them on that step of your sequence for many months.

Very poor response to participants' questions. Presenter was too defensive!

Make clear at outset what will and will not be covered in the explanation of T.A.

A task analysis might be beneficial for demonstration purposes.

Smoking annoys (cause sinus pain, eye burn, etc.) Explanations were very clear. At one point Carole allowed the group (or certain individuals) to take up too much time.

Carol: Don't apologize for using technical jargon - use it and define it, if appropriate, but as a semi-knowledgeable person I felt "patronized" by your apology. Important to point out that some steps in the TA may not be absolutely necessary to complete objective, i.e., turn on water - that may be a whole objective in and of itself.

I feel that we belabored points in this session. The people should have referred back to the steps previously brought up & that would have answered their questions.

Mostly a recapitulation of topics I already knew.

Somewhat difficult to complete as two presenters involved. Good materials. I find your differentiating "Logical" & "Individual" T.A.'s a good concept.

See additional comments on last page.

SKILL ACQUISITION OUTLINE

Good information - well presented!

Excellent.

Very useful & practical - a good organizer.

Sorry to be so unspecific in my rating but your outline after attending behaviors confuses me. My own background is very heavily language development based & I feel perhaps your outline is too simplistic for my taste.

Look at Bruner's three stages of representation. The presenter did not appear to have a cl understanding of the theories involved.

Again it would be helpful if we had all of the materials discussed and bound in order.

Please do not move around so much. I found seeing screen difficult because of constant movement in front of it.

Good review.

Too rapid.

Would need to be more specific to serve as a hand-out or information packet within a ALRC.

Sequence should be reassessed. Most, not new to a well-prepared teacher- that is, from a good preparation program.

Think most of us knew this area already.

Same as above.

VISUALS, DISPLAYS, HANDOUTS, RESOURCES

Excellent.

An annotated bibliography of the resources on display, and resources that you find most useful, would be helpful and appropriate.

The use of the two overhead projectors was interesting.

See above comment.

Your materials are great, well organized, easy to attend to during discussion and very worthwhile especially for take home & future reference value.

A lot of it would need elaboration to be functional.

Needs to be further defined for teachers.

Distribute handouts at appropriate times - too many to deal with all at once.

Should have copies of all overlays. Also number the pages or a better system to locate the individual sheets of paper.

SUMMARY EVALUATION QUESTIONS

1. What was your reason for attending this presentation?

Was asked to attend.

Learn.

Representing an ARC because of my involvement w/ severely handicapped.

To learn new materials & techniques for SPH.

To learn about learning characteristics.

To secure information to be replicated in the region served by the ALRC.

Materials for the severely handicapped is a great weakness in my region.

Felt it would fill some needs I see in my role.

Was told by superior to be here! I should not have been the one from our staff, but had to for several reasons. Glad I could come, however.

I was invited by NEALRC.

I hoped to hear some stimulating dialogue and new ideas.

I was sent.

Representative of local LRC.

Was asked to represent regional LRC.

Opportunity offered me to broaden my understanding of this area.

Later in the year, I will be working with teachers of the s/p & multiply handicapped & the types of materials they use with the kids.

Problems with public school teachers that work with children with behavior problems.

Interest in S & PMR, & hearing impaired materials for assistance to the State ALRC's

To learn more about the current developments in the area of the S & P.

To acquire more knowledge of materials that relate to the S & P. Impaired.

Take away increased skills to aid regional clients in servicing severe/profound handicappe population.

Several of our states are moving program priorities to severely handicapped education.

To gain expertise in an area in which I feel not fully versed.

2. What did you like LEAST about the presentation?

Speed, amount of information.

Too quick-moving & too much, although I wanted as much as possible.

All sitting & listening/ no active participation.

Too much time was spent on task analysis discussion.

Not clear as to purpose prior to input.

Information was most useful. However, my entry level was not that of the more verbal ones in attendance.

The lack of discussion/question time.

Materials (written) could have been organized in a notebook. No participation, other than questions from audience.

Lack of some materials and mechanical organization of those handed out.

The wide scope of the presentation.

That all the overheads were not supplied; would like materials to be as comprehensive as possible for use by my colleagues who did not attend.

I didn't like any part least, but wish we could have spent more time on assessment.

The speed & quantity of information.

How can I implement it across the state.

The level discrepancy between population described & task analysis developed.

Behavior modification & Concrete vs abstract.

Assessment guide presentation & over-emphasis on task analysis.

Chuck's speed in presenting.

At some points, seemingly lack of organization (at beginning). Presentor expressing conc during presentation about the quality of the presentation.

3. What did you like BEST about the presentation?

Amount of information & quick pace.

Quality of information.

Presenters knew subject & could relate this effectively. Content was good and meaningful

The handouts - to refresh my memory when I get back.

Carole Price's work.

Organization - Content.

The many handouts and concrete examples. Also, timing was good, i.e., you finished the different sections on time.

Willingness to illuminate & repeat - your verbal reinforcement when asked a question - Broad spectrum of ideas - very well planned. Constant asking if we have questions.

The materials & organization.

Mr. Hedbring was interesting. I hope his enthusiasm continues.

The use of realism and examples of practical application of techniques in real situations.

The visuals and their presentation.

Clear, detailed and well planned. A good package to fill an urgent need.

Comprehensiveness.

Task analysis - its about the only thing I have experience with when working with the s/p hand - besides the speech & language component.

Potential to check a tool that could be sueful to large numbers of public school teachers.

Learning about the resource!

The overview was very good.

Task analysis format & related materials.

Good evaluation procedure. Good handouts.

General organization of presentation day.

Reference materials, etc, bibliography, processes.

Any additional comments.

Use of additional media (i.e. slides, filmstrips, etc.) might tighten-up the overall effec of the presentation.

Impressed with Carole's experience with residents from institutional settings.

This presentation required basic information of concepts covered. Not appropriate for the participants who had none of this baseline information. Charles - please omit "Excellent Comment", etc. After the 30th time, it begins to sound most insincere. Sometimes had diffi culty with the though flow from one point to the other.

The general comment about this evaluation scale - all positives should be at one end and negatives at the other. Most of this material wasn't new to me, but keeping in mind the intended audience, this seems very helpful. There's a lot of information included in one

To repeat: Slow down pace; sufficient handouts; number or code materials - especially in quick 3 day session you've broken down into 6 hours or less. Omit "okay?" I like the idea of evaluation at end of each session. I plan to try this. Thank you!

I do mind the fact that your sequences and some of the published material is way beyond the level of the population defined by your 4 definitions. I would be much happier if during task analysis you had concentrated on sucking responses, eye contact, etc.

You are trying to provide a 4 year teacher training sequence in a kit. It can't be done! Good luck, you still need to do a great deal of homework.

I will look forward to seeing this material presented in book form. This will make absorb this material considerably easier.

This should be helpful in addressing myself to my fellow staff members concerns on implementing PL 94-142 especially setting up behavioral objectives.

Had no problem with your individual speech rates; but you might repeat or summarize your important points at the end of your 5 sections for those who voice this concern.

I wish this could have been a four-day portion to enable us to develop some of the points more thoroughly.

I've spent 6+ years working with Beh. Mod. systems in mental institutions. But the rapidity of paper shuffling, terms, & verbal input was too much to keep up with. Possibly this is a planned tactic to encourage purchase of your services but I feel it may hinder that purchase. If same was presented to regular teachers, it would be too much.

Your alternating rating scale could work against you if people don't attend to specifics and just operate on habitual basis.

Meaningful on teacher level but not for our center per se. We need more concrete ideas lik the task analysis etc. Need to clarify which children these techniques worked for. Deaf/ blind.

Lack of any clear statement of objectives prior to presentation.

Keep up the good work!

(1) Got bogged down on task analysis for toothbrushing. Responsibility of presentor to mov on more quickly and at the same time answer question. Although I have been somewhat negative, the positive aspect of gaining awareness in the specific area was extremely benefic

APPENDIX K

Selection Verification Form

Specialized Office Three
Selection Verification Form
RVS 6/75

Evaluation Form #1
Material ID #___________
Evaluator___________
Date___________

APPROPRIATENESS/EFFECTIVENESS
Selection Verification Form

Material Identification

TI ___________

AU ___________

PU ___________

PB/AD ___________

____

CATALOG # ___________ S3 ___________

MATERIAL DESCRIPTION

I. SUBJECT MATTER
___ A. Psychomotor Development
___ B. Reading
___ C. Language Arts
___ D. Mathematics
___ E. Social Studies
___ F. Science
___ G. Physical Education
___ H. Fine Arts
___ I. Self Care Skills
___ J. Personality Development
___ K. Daily Living Skills
___ L. Other. Specify ___________

II. INPUT MODE
___ A. Auditory
___ B. Visual
___ C. Tactile
___ D. Auditory-Visual
___ E. Visual-Tactile
___ F. Auditory-Tactile
___ G. Multisensory
___ H. Other. Specify ___________

III. RESPONSE MODE
___ A. Verbal
___ B. Look-Listen
___ C. Manipulative
___ D. Kinesthetic
___ E. Mark, Circle
___ F. Print, Cursive
___ G. No Specific

IV. INSTRUCTIONAL LEVEL
___ A. Early Childhood (0-2)
___ B. Preschool (3-4)
___ C. Kindergarten (5)
___ D. Primary (6-8)
___ E. Intermediate (9-11)
___ F. Junior High (12-14)
___ G. Senior High (15-17)
___ H. Adult

V. HANDICAPPING CONDITIONS
___ A. Mentally Retarded
___ B. Emotionally Disturbed
___ C. Specific Learning Disabled
___ D. Physically Handicapped or Other Health Impaired
___ E. Speech Impaired
___ F. Multiply Handicapped
___ G. Deaf
___ H. Blind

VI. FORM/FORMAT
___ A. Printed
___ B. Non-Print
___ C. Manipulative
___ D. Visually
___ E. Auditory

VII. EVALUATION INFORMATION
___ A. Appropriateness data available
___ B. Effectiveness data available
___ C. No verification data available

Completed By ___________
Date ___________
Approved for Accession ___________
Date ___________
Requested ___________
Date ___________

SUMMARY

APPROPRIATENESS

Use Frequency___________
____
____

Use Recommendations___________
____
____

Compiled lists___________
____

EFFECTIVENESS

Teacher judgements___________
____
____

Learner Impact___________
____
____
____

Specialized Office Three
Selection Verification Form

③ UF ㊶

FREQUENCY OF USE AND/OR PURCHASE

A. IMC/RMC Collections (NCEMMH Computer List)

___ 1. 95-100% (18-19/19)
___ 2. 84-89% (16-17/19)
___ 3. 74-79% (14-15/19)
___ 4. 63-68% (12-13/19)
___ 5. 53-58% (10-11/19)
___ 6. 53% (1-10/19)
___ 7. Not Included

B. IMC/RMC Network Survey (Most Checked Out Items)

1. Mean of the Ranks

___ a. (3.00-6.00)
___ b. (6.00-9.00)
___ c. (9.00-12.00)
___ d. Not Ranked

2. Number of Times Mentioned

___ a. 22
___ b. 20
___ c. 5
___ d. 4
___ e. 3
___ f. Not Mentioned

C. Albany ASEIMC Most Loaned Items (1971)

___ 1. Ranked (1-2)
___ 2. Ranked (3-12)
___ 3. Ranked (9-13)
___ 4. Not Ranked

D. Buffalo ASEIMC Most Loaned Items (1971)

___ 1. Ranked (1-5)
___ 2. Ranked (6-10)
___ 3. Ranked (11-15)
___ 4. Not Ranked

E. CUNY ASEIMC Most Loaned Items (1971)

___ 1. Ranked (1-5)
___ 2. Ranked (6-10)
___ 3. Ranked (11-15)
___ 4. Not Ranked

F. Albany ASEIMC Most Loaned Items (1969)

___ 1. Included in the Listing
___ 2. Not included in the Listing

G. Buffalo ASEIMC Most Loaned Items (1969)

___ 1. Included in the Listing
___ 2. Not included in the Listing

H. CUNY ASEIMC Most Loaned Items (1969)

___ 1. Included in the Listing
___ 2. Not included in the Listing

I. Kansas SEIMC Frequence of Materials Loaned Study

___ 1. Included in the Listing
___ 2. Not wncluded in the Listing

J. Northwest ASEIMC Study (Latham, 1975)

___ 1. Very High Frequence
___ 2. High Frequency
___ 3. Medium Frequency
___ 4. Low Frequency
___ 5. Not Mentioned

K. IMC/RMC Network Evaluation Committee Study

___ 1. Included in the Priority Listing
___ 2. Not included in the Priority Listing

L. Other; Specify ________________________
____

___ 1. Very High Frequency
___ 2. High Frequency
___ 3. Medium Frequency
___ 4. Low Frequency
___ 5. Not Mentioned

M. Other; Specify ________________________
____

___ 1. Very High Frequency
___ 2. High Frequency
___ 3. Medium Frequency
___ 4. Low Frequency
___ 5. Not Mentioned

N. Other; Specify ________________________
____

___ 1. Very High Frequency
___ 2. High Frequency
___ 3. Medium Frequency
___ 4. Low Frequency

③ UF ㊷

FREQUENCY OF USE INSTRUCTIONAL MATERIALS SERIES

1. Reading Series

___ a. Very High Frequency (66)
___ b. High Frequency (17-40)
___ c. Medium Frequency (10-12)
___ d. Low Frequency (6-7)
___ e. Very Low Frequency (1-5)
___ f. Not Mentioned

2. Reading Cobasal Series

___ a. Very High Frequency (32)
___ b. High Frequency (15-16)
___ c. Medium Frequency (10)
___ d. Low Frequency (1-7)
___ e. Not Mentioned

3. Reading Supplementary Series

___ a. Very High Frequency (19-23)
___ b. High Frequency (11)
___ c. Medium Frequency (6-8)
___ d. Low Frequency (1-5)
___ e. Very Low Frequency (0)
___ f. Not Mentioned

4. Reading Workbooks

___ a. Very High Frequency (181)
___ b. High Frequency (59)
___ c. Medium Frequency (15)
___ d. Low Frequency (608)
___ e. Very Low Frequency (1-5)
___ f. Not Mentioned

5. Spelling Materials

___ a. Very High Frequency (115)
___ b. High Frequency (32)
___ c. Medium Frequency (13-17)
___ d. Low Frequency (1-6)
___ e. Not Mentioned

6. Mathematics Materials

___ a. Very High Frequency (34)
___ b. High Frequency (19-21)
___ c. Medium Frequency (10-14)
___ d. Low Frequency (5-8)
___ e. Very Low Frequency (0-3)
___ f. Not Mentioned

7. Mathematics Textbooks Series

___ a. Very High Frequency (7)
___ b. High Frequency (4-6)
___ c. Medium Frequency (0-3)
___ d. Not Mentioned

8. Social Studies Textbooks

___ a. Very High Frequency (153)
___ b. High Frequency (30)
___ c. Medium Frequency (10-14)
___ d. Low Frequency (5-9)
___ e. Very Low Frequency (0-4)
___ f. Not Mentioned

9. Science Textbook Series

___ a. Very High Frequency (159)
___ b. High Frequency (33)
___ c. Medium Frequency (17)
___ d. Low Frequency (4-9)
___ e. Very Low Frequency (0-3)
___ f. Not Mentioned

10. Science Materials

___ a. Very High Frequency (13)
___ b. High Frequency (8-12)
___ c. Medium Frequency (4-7)
___ d. Low Frequency (1-3)
___ e. Not Mentioned

11. Physical Education Materials

___ a. Very High Frequency (23-25)
___ b. High Frequency (9-16)
___ c. Medium Frequency (6-8)
___ d. Low Frequency (1-5)
___ e. Not Mentioned

12. Audiovisual Equipment

___ a. Very High Frequency (190)
___ b. High Frequency (115-147)
___ c. Medium Frequency (62-96)
___ d. Low Frequency (25-45)
___ e. Very Low Frequency (1-8)
___ f. Not Mentioned

④ UR (51)

RECOMMENDED FOR USE

A. IMC/RMC Network Office Survey (Most Useful Items - $\bar{x}$ of Rankings)

___ 1. Very High Recommendation Frequency (2.00-5.00)
___ 2. High Recommendation Frequency (5.00-8.00)
___ 3. Medium Recommendation Frequency (8.00-11.00)
___ 4. Low Recommendation Frequency (11.00-13.00)
___ 5. Very Low Recommendation Frequency (13.00-16.00)
___ 6. Not mentioned.

B. Florida Resource Center Alpha. Recommendations

1. Materials for Younger TMR

___ a. Included
___ b. Not Included

2. Materials for Older TMR

___ a. Included
___ b. Not Included

3. Materials for Elementary MR

___ a. Included
___ b. Not Included

4. Materials for Secondary MR

___ a. Included
___ b. Not Included

5. Materials for ED and Socially Maladjusted

___ a. Included
___ b. Not Included

6. Materials for LD

___ a. Included
___ b. Not Included

7. Materials for Speech Handicapped

___ a. Included
___ b. Not Included

8. Materials for Homebound/Hospitalized

___ a. Included
___ b. Not Included

C. Other; Specify ______________________
____

D. Other; Specify ______________________
____

E. Other; Specify ______________________
____

F. Other; Specify ______________________
____

④ UR (52)

CRITERIA PAPERS AND PROFESSIONAL LITERATURE

A. Criteria Papers

___ 1. SLD/Math

- ___ a. Included
- ___ b. Not Included

___ 2. SLD/RDG

- ___ a. Included
- ___ b. Not Included

___ 3. MR

- ___ a. Included
- ___ b. Not Included

___ 4. ED

- ___ a. Included
- ___ b. Not Included

___ 5. Other: Specify ____________________

- ___ a. Included
- ___ b. Not Included

B. Professional Literature

___ 1. Cite Source ____________________

___ 2. Cite Source ____________________

___ 3. Cite Source ____________________

④ CL ⑥1

Specialized Office Three
Selection Verification Form

COMPILED LISTS

A. MERC (Mars Listing)

___ 1. Included in the Listing
___ 2. Not Included in the Listing

B. Computer Based Project

___ 1. Included in the Listing
___ 2. Not Included in the Listing

C. PA/RRC

___ 1. Included in the Listing
___ 2. Not Included in the Listing

D. ALC

___ 1. Included in the Listing
___ 2. Not Included in the Listing

E. Texas IMC

___ 1. Included in the Listing
___ 2. Not Included in the Listing

F. Kentucky IMC

___ 1. Included in the Listing
___ 2. Not Included in the Listing

G. Comp Project

___ 1. Included in the Listing
___ 2. Not Included in the Listing

H. California IMC Bibliographies

1. Reading

___ a. Included
___ b. Not Included

2. Affective Materials/Preschool

___ a. Included
___ b. Not Included

3. Affective Materials/Adolescent

___ a. Included
___ b. Not Included

4. Vocational and Career Guidance

___ a. Included
___ b. Not Included

5. Perceptual Materials

___ a. Included
___ b. Not Included

6. Sex Education

___ a. Included
___ b. Not Included

7. Mathematics Materials

___ a. Included
___ b. Not Included

8. Science Materials

___ a. Included
___ b. Not Included

9. Speech and Language Arts

___ a. Included
___ b. Not Included

I. Southwest RMC/ALRC Media Recommendations

___ 1. Included
___ 2. Not Included

J. St. Francis Children's Activity and Achievement Center: Recommended for Use

___ 1. Included
___ 2. Not Included

③ UF ㊸

CURRENTLY IN USE IN PROGRAMS AND PROJECTS FOR THE HANDICAPPED

A. St. Francis Children's Activity and Achievement Center

___ 1. Included in the listing
___ 2. Not included

B. Central Colony

___ 1. Included in the listing
___ 2. Not included

C. Children's Treatment Center

___ 1. Included in the listing
___ 2. Not included

D. Rutland Center

___ 1. Included in the listing
___ 2. Not included

E. St. Coletta Training School

___ 1. Included in the listing
___ 2. Not included

F. Madison Public Schools

___ 1. Included in the listing
___ 2. Not included

G. Maze

___ 1. Included in the listing
___ 2. Not included

H. Georgia Academy for the Blind

___ 1. Included in the listing
___ 2. Not included

I. Northwest Regional Center for Deaf-Blind Children

___ 1. Included in the listing
___ 2. Not included

Specialized Office Three
Selection Verification Form

② TJ ⑳ OR ㉚

EVALUATION INFORMATION

A. Teacher Judgments

___ 1. Manitowoc Study

- ___ a. Objective One: Form Discrimination
    - ___ (1) Rating greater than 3.5
    - ___ (2) Rating 3.5 or less
    - ___ (3) Not used
- ___ b. Objective Two: Understanding Basic Numbers
    - ___ (1) Rating greater than 3.5
    - ___ (2) Rating 3.5 or less
    - ___ (3) Not used
- ___ c. Objective Three: Basic Processes
    - ___ (1) Rating greater than 3.5
    - ___ (2) Rating 3.5 or less
    - ___ (3) Not used
- ___ d. Objective Four: Fractions
    - ___ (1) Rating greater than 3.5
    - ___ (2) Rating 3.5 or less
    - ___ (3) Not used
- ___ e. Objective Five: Money
    - ___ (1) Rating greater than 3.5
    - ___ (2) Rating 3.5 or less
    - ___ (3) Not used
- ___ f. Objective Six: Measurement
    - ___ (1) Rating greater than 3.5
    - ___ (2) Rating 3.5 or less
    - ___ (3) Not used
- ___ g. Objective Seven: Social Arithmetic
    - ___ (1) Rating greater than 3.5
    - ___ (2) Rating 3.5 or less
    - ___ (3) Not used
- ___ h. Objective Eight: Quantitative Vocabulary
    - ___ (1) Rating greater than 3.5
    - ___ (2) Rating 3.5 or less
    - ___ (3) Not used

EVALUATION CODE TRANSLATIONS

OLD	NEW
10	1
20	Not used
30	2
41A	4 C,D,E
41BK	3 C,D,E
41C-H	3 C,D,E
41I	3 C,D,E
41J	3 C,D,E
42	3 C
43-A	3 C,D,E
43-B	3 A,I
43-C	3 D
43-D	3 D
43-E	3 C,I
43-G	3 A
43-H	3 F
43-I	3 F
51A	4 C,D,E
51B-1	4 I
51B-2	4 I
51B-3	4 C
51B-4	4 C
51B-5	4 D
51B-6	4 E
51B-7	4 H
51B-8	4 G

EVALUATION CODE TRANSLATIONS - Continued

OLD	NEW
52-1	4 E
52-2	4 E
52-3	4 C
52-4	4 D
53	4 C,D,E
54	4 C,D,E
61	4 C,D,E
62	4 C,D,E

STANDARDIZED EVALUATION CODES

1. This material has been reviewed by Specialized Office *Three* and judged appropriate for use with the *S3 Relevant Learner Descriptions*.

2. Field evaluation data are available. Results show that these materials are suitable for the *S3 Relevant Learner Descriptions*.

3. Evidence shows that this material is currently being used by teachers in educational programs for the *S3 Relevant Learner Descriptions*.

4. This material hs been recommended by an authoritative body for use with the *S3 Relevant Learner Descriptions*.

S3 RELEVANT LEARNER DESCRIPTIONS

A. Custodial Mentally Handicapped

B. Deaf Blind

C. Educable Mentally Handicapped

D. Emotionally Disturbed

E. Learning Disabilities

F. Multiply Handicapped

G. Physically Handicapped

H. Speech Handicapped

I. Trainable Mentally Handicapped

APPENDIX L

Material Descriptor Checklist

I. MEDIA FORMAT; MEDIA FORMAT VARIANT -

A. Printed Material

1. Print/Picture Content

___ a. Braille*
___ b. Nemeth Code*
___ c. Large Type Materials*
___ d. Primary Type*
___ e. Regular Type*
___ f. Raised Line Drawings*
___ g. Picture Content (1/2 or 1/2 of total content)
___ h. Rebus*
___ i. Modified Alphabet*

    ___ (1) ITA (Initial Teaching Alphabet*)
    ___ (2) Color Keyed Materials*
    ___ (3) Diacritical Marking
    ___ (4) Unifon Sound Alphabet
    ___ (5) ________________________

___ j. Inkprint*(printed Braille)
___ k. ________________________

2. Visual Format (see page I-5)

3. Type of Book

___ a. Activity Books*
___ b. Braille Books*
___ c. Comic Books*
___ d. Picture Books*
___ e. Preprimers*
___ f. Primers*
___ g. Reference Books*

    ___ (1) Bibliographies*
    ___ (2) Dictionaries*
    ___ (3) Encyclopedias*
    ___ (4) Glossary
    ___ (5) ________________________

___ h. Talking Books*
___ i. Textbooks*
___ j. Workbooks*
___ k. Worktexts*
___ l. ________________________

4. Nonbook

___ a. Flashcards*

    ___ (1) Pictures
    ___ (2) Numbers
    ___ (3) Words

___ b. Newspapers*
___ c. Pamphlets*
___ d. Periodicals*
___ e. Storycards*
___ f. Worksheets*
___ g. ________________________

B. Nonprint Material

1. Physical Description of Picture and Diagram Materials

___ a. Color
___ b. Constructed of ________________
____
___ c. Mounted/Framed
___ d. Print Size
___ e. Size (cm. by cm.)

2. Type of Picture/Symbol

___ a. Art Prints*
___ b. Photographs*
___ c. Picture Cards*
___ d. Posters*
___ e. Sequence Cards*
___ f. Signs*
___ g. Study Prints*
___ h. ________________________

3. Type of Diagram

___ a. Calendars*
___ b. Charts*
___ c. Experience Charts*
___ d. Graphs*
___ e. Maps*

    ___ (1) Flat
    ___ (2) Globes*
    ___ (3) Horizontal Scale
    ___ (4) Relief (Vertical Scale)

___ f. Number Lines*

C. Manipulative Materials*

1. Physical Description of Manipulatives

___ a. Constructed of ____________
____
___ b. ____________________

2. Type of Manipulative

___ a. Abacus*
___ b. Alphabet
___ c. Art Material

  ___ (1) Number of Articles
  ___ (2) Describe ____________
  ____

___ d. Connector/Chain

  ___ (1) Number of Pieces
  ___ (2) Links
  ___ (3) Blocks

___ e. Dice
___ f. Dioramas*

  ___ (1) Size
  ___ (2) Number of Pieces

___ g. Games*

  ___ (1) Number of Pieces
  ___ (2) Number of Players

___ h. Geoboard
___ i. Geometric Forms*/Shapes*

  ___ (1) Number of Pieces
  ___ (2) Two Dimensional
  ___ (3) Three Dimensional

___ j. Magnifier
___ k. Measurer

  ___ (1) Ruler
  ___ (2) Tape Measure
  ___ (3) Metric
  ___ (4) Regular

___ l. Measuring Container
___ m. Models*
___ n. Pegboard
___ o. Puppets*
___ p. Puzzles*

  ___ (1) Number of Pieces
  ___ (2) Framed

___ q. Scale
___ r. Sculpture
___ s. Specimen/(Realia*)

  ___ (1) Number of Pieces
  ___ (2) Play Money*
  ___ (3) Plant
  ___ (4) Rocks*
  ___ (5) Shell
  ___ (6) Toys*

___ t. Stencils*
___ u. Tool
___ v. ____________________

D. Visually Projected Material

1. Film (Check 1 or 2)

___ a. Captioned Films*
___ b. Black and White*
___ c. Color*
___ d. Film Cartridges*

  ___ (1) Loop
  ___ (2) Reel-Reel

___ e. Kinescope Recordings*
___ f. Reel-To-Reel Tapes*
___ g. Running Time (min.)
___ h. Size (mm.)

  ___ (1) Films 8mm.*
  ___ (2) Films Super 8mm.*
  ___ (3) Films 16mm.*
  ___ (4) Films 35mm.*

___ i. Sound Track on ____________
____
___ j. Special Playback Equipment
____
___ k. ____________________

2. Filmstrips

___ a. Audible Signal (Manual)
___ b. Automatic Sync
___ c. Black and White*

___ d. Captioned Filmstrips*
___ e. Color*
___ f. Mounted (Filmslip*)
___ g. Number of Frames
___ h. Running Time (min.)
___ i. Sound Track on ___________

3. Microform (Check 1, 2, 3 or 4)

___ a. Aperture Card
___ b. Microfiche*
___ c. Microfilms*

  ___ (1) Number of Frames

___ d. Micropaques* (Microcards)
___ e. Size (cm.)

4. Transparencies*

___ a. Black and White*
___ b. Color*
___ c. Mounted
___ d. Overlays
___ e. Size of Transparent Surface (cm.)
___ f. Soundtrack on ___________
____

5. Videotapes*

___ a. Black and White*
___ b. Color*
___ c. Captioned
___ d. Cassette Dimension (in.)
___ e. Reel Diameter (in.)
___ f. Running Time (min.)
___ g. Sound Track on ___________

6. Slides*

___ a. Black and White*
___ b. Color
___ c. Captioned
___ d. Daylight
___ e. Size of Mount (in.)
___ f. Soundtrack on ___________
____
___ g. Stereoscopic Slides*

7. Microscope Slides*

E. Auditory Materials

1. Audiotape (Check 1, 2 or 3)

___ a. Number of Tracks
___ b. Number of Sides
___ c. Reel-to-Reel Tapes*
___ d. Running Time (min.)
___ e. Soundtrack for ___________
____
___ f. Tape Cartridges*
___ g. Tape Cassettes*

2. Phonograph Records*

___ a. Diameter (in.)
___ b. Running Time (min.)
___ c. Soundtrack for ___________
____
___ d. Speed (rpm)

  ___ (1) 16
  ___ (2) 33
  ___ (3) 45
  ___ (4) 78

___ e. Stereophonic

3. Audiotape Flashcards*

___ a. Run Time (sec.)
___ b. Special Playback Equipment Needed ___________
___ c. Student Track

F. Other Material Descriptors

___ 1. Kits*
___ 2. Learning Activity Packages*
___ 3. Multimedia Instruction*
___ 4. Nonverbal Auditory Materials*
___ 5. Programmed Materials*
___ 6. Self-Pacing Materials*
___ 7. Series*
___ 8. Supplementary Reading Materials*
___ 9. Tactile Materials*

G. Teacher Materials*

___ 1. Checklists*
___ 2. Curriculum Guides*
___ 3. Duplicating Masters*
___ 4. Instructional Leaflets*

___ 5. Reproduction Masters*
___ 6. Resource Guides*
___ 7. Teacher Developed Materials*
___ 8. Teachers Guides*
___ 9. Teacher Editions*
___10. Unit Plans*

H. Equipment*

___ 1. Adaptive Devices*
___ 2. Audio Equipment*
___ 3. Braille Writing Devices*
___ 4. Electromechanical Aids*
___ 5. Low Vision Aids*
___ 6. Microimage Viewers*
___ 7. Microscopes*
___ 8. Mobility Aids*
___ 9. Phonographs*
___10. Projection Equipment*
___11. Prostheses*
___12. Sensory Aids*
___13. Tachistoscopes*
___14. Tape Recorders*
___15. Teaching Machines*
___16. Telephone Communication System*
___17. Wheelchairs*

I. Tests

___ 1. Achievement Tests*
___ 2. Aptitude Tests*
___ 3. Association Tests*
___ 4. Attitude Tests*
___ 5. Auditory Tests*
___ 6. Behavior Rating Scales*
___ 7. Culture Free Tests*
___ 8. Diagnostic Tests*
___ 9. Evaluation*
___10. Group Tests*
___11. Individual Tests*
___12. Intelligence Tests*
___13. Interest Scales*
___14. Nonverbal Tests*
___15. Perception Tests*
___16. Performance Tests*
___17. Personality Tests*
___18. Preschool Tests*
___19. Prognostic Tests*
___20. Projective Tests*
___21. Reading Tests*
___22. Screening Tests*
___ 23. Speech Tests*
___ 24. Standardized Tests*
___ 25. Tactual Tests*
___ 26. Verbal Tests*
___ 27. Vision Tests*
___ 28. Vocational Aptitudes Tests*
___ 29. ____________________
___ 30. ____________________
___ 31. ____________________
___ 32. ____________________

II. CONTENT AREA; SKILL AREA: (1a, 1b)

C. Reading*

1. Reading Readiness*

___ a. Classification*
___ b. Color Concepts*
___ c. Copy/Trace
___ d. Cut/Paste/Position
___ e. Designs/Patterns
___ f. Directionality*/Laterality*
___ g. Dot Joining
___ h. Label*/Name
___ i. Left to Right Progression*
___ j. Letter Recognition*
___ k. Likenesses and Differences*
___ l. Listening*
___ m. Matching*
___ n. Part Whole Relationships*
___ o. Position Words*
___ p. Reversals*
___ q. Rhyming*
___ r. Serial Ordering*
___ s. Spatial Relationships*

2. Phonics*/Word Attack*

___ a. Blends
___ b. Consonant Variant
___ c. Consonants*
___ d. Final Consonants*
___ e. Initial Consonants*
___ f. Medial Consonants*
___ g. Digraphs

    ___ (1) Consonant
    ___ (2) Vowel

___ h. Diphthongs*
___ i. Hard/Soft Sound
___ j. Phonics Rules
___ k. Silent Letters
___ l. Sound/Symbol Relationship
___ m. Vowel Variant
___ n. Vowels*
___ o. Vowel (Double)
___ p. Initial Vowels*
___ q. Medial Vowels*
___ r. Long Vowels*
___ s. Short Vowels*
___ t. ______________________

3. Reading Comprehension*

___ a. Author's Purpose
___ b. Cause and Effect
___ c. Character Assessment
___ d. Comprehension* (Silent Reading)
___ e. Context Clues* (Picture, Sentence)
___ f. Critical Reading/Fact vs. Fiction
___ g. Drawing Conclusions/Predicting Outcomes
___ h. Following Directions
___ i. Inference/Implication
___ j. Locating Answers/Detail
___ k. Main Idea/Main Character
___ l. Mood/Motives/Emotions
___ m. Sequence of Events or Ideas
___ n. Skimming*/Scanning
___ o. Specific Recall
___ p. Summarizing*
___ q. ______________________

4. Structural Analysis*

___ a. Compound Words*
___ b. Contractions*
___ c. Derivation*
___ d. Placing Accent Marks
___ e. Plurals*
___ f. Possessives
___ g. Prefixes*
___ h. Root Words
___ i. Suffixes*
___ j. Syllabication*
___ k. Word Endings (Inflectional)
___ l. Words of Comparison
___ m. ______________________

5. Vocabulary*

___ a. Abstract Vocabulary*
___ b. Antonyms/Opposites
___ c. Core Vocabulary*
___ d. Color Words
___ e. Descriptive Words
___ f. Homonyms*
___ g. Idioms*
___ h. Multiple Use Words/Word Connotation

___ i. Sight Vocabulary*
___ j. Synonyms*
___ k. Word Families/Patterns
___ l. Word Origins
___ m. Word Picture Matching
___ n. ______________________________

6. Oral Reading*

___ a. Comprehension (Oral)
___ b. Fluency
___ c. Intonation
___ d. Rate
___ e. ______________________________

7. Literary Forms*

___ a. Anthologies*
___ b. Autobiographies*
___ c. Biographies*
___ d. Drama
___ e. Fiction*
___ f. Non-Fiction*
___ g. Poetry*
___ h. ______________________________

8. Types of Programs

___ a. Beginning Reading*
___ b. Developmental Reading*
___ c. Experimental/New Alphabet

    ___ (1) Initial Teaching Alphabet*

___ d. High Interest Low Vocabulary*
___ e. Independent Reading*
___ f. Language Arts* (Correlated)
___ g. Linguistic Approach
___ h. Non-Oral Reading Approach
___ i. Phonemic Alphabet*
___ j. Remedial Reading*
___ k. ______________________________

II. CONTENT AREA; SKILL AREA (1a, 1b):

E. Mathematics

1. Sets*

2. Numbers*

a. Operations*

___ (1) Addition*

    ___ (a) Associative Principle
    ___ (b) Carrying (Regrouping*)
    ___ (c) Commutative Principle
    ___ (d) Concept
    ___ (e) Facts*
    ___ (f) Identify Element
    ___ (g) Horizontal
    ___ (h) Missing Factors*
    ___ (i) Multiple Column
    ___ (j) Ragged Column

    ___ (k) Subtraction Integration
    ___ (l) Single Column
    ___ (m) Two Column
    ___ (n) With Zero
    ___ (o) ___________________________

___ (2) Subtraction*

    ___ (a) Addition Integration
    ___ (b) Borrowing (Regrouping*)
    ___ (c) Concept
    ___ (d) Facts*
    ___ (e) Horizontal
    ___ (f) Ragged Column

    ___ (g) Single Column
    ___ (h) Three or More Columns
    ___ (i) Two Column
    ___ (j) With Zero

___ (3) Multiplication*

    ___ (a) Concept
    ___ (b) Distributive Principle
    ___ (c) Division Integration
    ___ (d) Facts*
    ___ (e) Horizontal
    ___ (f) Multiplication with Zero
    ___ (g) One multiplier, Carrying
    ___ (h) One Multiplier, No Carrying
    ___ (i) Two or More Multipliers, Carrying
    ___ (j) Two or More Multipliers, No Carrying
    ___ (k) ___________________________

___ (4) Division*

    ___ (a) Division, Horizontal
    ___ (b) Division, One Place
    ___ (c) Division, Two or More Place
    ___ (d) Division Concept
    ___ (e) Division with Zero
    ___ (f) Facts*
    ___ (g) Multiplication Integration
    ___ (h) One Place Divisor, Two or More Place Dividend and Quotient
    ___ (i) One Place Divisor, Two More Place Divident and Quotient
    ___ (j) Remainders
    ___ (k) Two Place Divisor and Divident, One Place Quotien

b. Relations*

    ___ (1) Charts/Tables
    ___ (2) Equalities*
    ___ (3) Graphing*
    ___ (4) Inequalities* (More, Less, Bigger, Smaller, Greater)
    ___ (5) One-to-One Relationship*
    ___ (6) ___________________________

3. Numeration*

___ a. Base Numbering Systems*
___ b. Counting* (Cardinal Concepts)
___ c. Decimals*

    ___ (1) Decimal/Percent Integration
    ___ (2) Introducing Concepts of Decimals

___ d. Expanded Notation (Renaming Numbers)
___ e. Fractions*

___ (1) Denominators
___ (2) Fraction/Percent Integration
___ (3) Fractional Parts/Construction
___ (4) Fractions - Addition
___ (5) Fractions Concept
___ (6) Fractions - Division
___ (7) Fractions - Multiplication
___ (8) Fractions - Subtraction

___ f. Integers
___ g. Mathematics Readiness*
___ h. Natural
___ i. Number Sequence (Before, After, Between)
___ j. Number Words
___ k. Numbers (Matching, Writing, Concept)
___ l. Numeral Recognition
___ m. Ordinal Concepts
___ n. Percents*

4. Geometry *

___ a. Basic Geometry
___ b. Estimation
___ c. Geometric Shapes/Construction
___ d. Sizes*
___ e. ______________________

5. Measurement*

___ a. Geometric Measurement
___ b. Making Change
___ c. Measurement Concepts
___ d. Metric System*
___ e. Modular Arithmetic*
___ f. Money Concepts*
___ g. Nongeometric Measurement
___ h. Other Measures
___ i. Temperature*
___ j. Time Concepts (Time Perspective *)
___ k. Time Telling*
___ l. ______________________
___ m. ______________________

6. Problem Solving* (Math Story Problems)

___ o.. Place Value*
___ p. Quantitative Concepts*
___ q. Ratio* (Proportions)
___ r. Rationals
___ s. Roman Numerals*
___ t. Rounding Off
___ u. Symbols
___ v. Whole
___ w. ______________

III. GRADE, INSTRUCTIONAL AND INTEREST LEVEL (2)

A. Instructional Level

___ 1. Infants*
___ 2. Early Childhood* Education
___ 3. Kindergarten*
___ 4. Primary Grades

    ___ a. Grade 1*
    ___ b. Grade 2*
    ___ c. Grade 3*

___ 5. Intermediate Grades*

    ___ a. Grade 4*
    ___ b. Grade 5*
    ___ c. Grade 6*

___ 6. Junior High Grades*

    ___ a. Grade 7*
    ___ b. Grade 8*
    ___ c. Grade 9*

___ 7. Senior High Grades

    ___ a. Grade 10*
    ___ b. Grade 11*
    ___ c. Grade 12*

___ 8. Adult Education

    ___ a. Multilevel*
    ___ b. Nongraded*

B. Interest Level

___ 1. Infants*
___ 2. Early Childhood*
___ 3. Kindergarten*
___ 4. Primary Grades

    ___ a. Grade 1
    ___ b. Grade 2
    ___ c. Grade 3

___ 5. Intermediate Grades*

    ___ a. Grade 4
    ___ b. Grade 5
    ___ c. Grade 6

___ 6. Junior High Grades*

    ___ a. Grade 7
    ___ b. Grade 8
    ___ c. Grade 9

___ 7. Senior High Grades

    ___ a. Grade 10
    ___ b. Grade 11
    ___ c. Grade 12

___ 8. Adult Education

C. Interest Area

___ 1. Adventure Stories*
___ 2. Animal
___ 3. Cartoons*
___ 4. Fantasy*
___ 5. Folk Tales*
___ 6. Foreign Theme*
___ 7. Frontier Pioneer
___ 8. Humor*
___ 9. Mystery Stories*
___ 10. Mythology*

___ 11. Nature
___ 12. Nursery Rhymes*
___ 13. Religion
___ 14. Plays*
___ 15. Riddles*
___ 16. Rural Theme
___ 17. Science Fiction*
___ 18. Science Related
___ 19. Social Studies Related
___ 20. Sports Stories*
___ 21. True Life
___ 22. Urban Theme

IV. INPUT-OUTPUT MODE (3)

A. Input Mode

___ 1. Auditory Input*
___ 2. Auditory-Tactile*
___ 3. Auditory-Visual*
___ 4. Multisensory*
___ 5. Tactile*
___ 6. Visual*
___ 7. Visual-Tactile*
___ 8. ________________________

B. Output Mode

___ 1. Knesthetic Response*
___ 2. Manual*
___ 3. Verbal Response*
___ 4. ________________________

V. INSTRUCTIONAL APPROACHES, TEACHING METHODS (4)

A. Approach (Rationale)

___ 1. Deductive Methods*
___ 2. Discovery Learning*
___ 3. Developmental Approach*
___ 4. Enrichment*
___ 5. Experiential Method*
___ 6. Experimental Method*
___ 7. Kinesthetic Method*
___ 8. Inquiry Training* (Inductive)
___ 9. Scientific Method*
___10. Sequential Approach*

B. Behavioral Objectives*

___ 1. Specified
___ 2. Not Specified

C. Classroom Management

___ 1. Ability Grouping
___ 2. Multiunit (Nongraded*)
___ 3. Open Education*
___ 4. Regular Class Placement*

D. Educational Programs

___ 1. Bilingual*
___ 2. Career Education*
___ 3. Compensatory/Remedial Approach*
___ 4. Guidance (Counseling)
___ 5. Homebound*
___ 6. Interdisciplinary*
___ 7. Migrant Education*
___ 8. Outdoor Education*
___ 9. Prevocational Education*
___10. Rehabilitation*
___11. Technical Education*
___12. Vocational Education*
___13. Vocational Rehabilitation*
___14. Work Study Programs*

E. Group Size/Direction

___ 1. Individual

    ___ a. Parents*
    ___ b. Peer Tutoring*
    ___ c. Self Directed Independent*
    ___ d. Teacher Directed (Tutoring)

___ 2. Small Group Instruction*

    ___ a. Pupil Directed
    ___ b. Teacher Directed

___ 3. Large Group Instruction*

    ___ a. Pupil Directed
    ___ b. Teacher Directed

F. Teacher Involvement

___ 1. Group Discussion*

    ___ a. Led by Pupil
    ___ b. Led by Teacher

___ 2. Lecture by Teacher
___ 3. Minimal Teacher Involvement
___ 4. No Teacher Involvement Necessary

G. Technique/Assist

___ 1. Behavior Management* (Behavior Modification*)

    ___ a. Extinction*
    ___ b. Negative Reinforcement*
    ___ c. Positive Reinforcement*
    ___ d. Punishment*

___ 2. Classroom Observation Techniques*
___ 3. Compressed Speech
___ 4. Computer Assisted Instruction*
___ 5. Computer Managed Instruction*
___ 6. Individualized Instruction*

    ___ a. Diagnostic/(Prescriptive Teaching*)
    ___ b. Micro Teaching*
    ___ c. Precision Teaching*

___ 7. Play
___ 8. Programmed Instruction
___ 9. Role Playing*/Skits*
___10. Simulation*
___11. Story Telling*
___12. Televised Instruction*
___13. Educational Television*

H. Therapy

___ 1. Art Therapy
___ 2. Bibliotherapy
___ 3. Hearing Therapy*
___ 4. Music Therapy*
___ 5. Occupational Therapy*
___ 6. Physical Therapy*
___ 7. Play Therapy*

APPENDIX M

List of Center Products

Title: Handwashing and Other Related Toileting Skills . . . and Toilet Training: How to Teach Your Developmentally Delayed Child

Author: Bowman, M., Calkin, A., & Grant, P.
Region: S-3

Abstract Description: The toilet training program for developmentally delayed preschool children with exceptional educational needs is intended to systematically guide parents through a sequenced training with their child.

Title: I CAN

Author: Wessel, J.
Region: S-3

Abstract Description: I CAN is a criterion referenced diagnostic-prescriptive instructional program for primary physical education, sports, and liesure activities; social skills, and related skills. In its adapted format it is targeted toward severely emotionally involved and autistic children.

Title: Materials Accession Process (MAP)

Author: Elder, J., Pellow, M., & Jipson-Greenstein, J.
Region: S-3

Abstract Description: The document describes S-3's MAP, which was developed to increase the involvement of special education professionals in the establishment of the NIMIS data base by encouraging them to function as locate sources for potential NIMIS materials. The MAP is intended to make the content of NIMIS directly relevant to NIMIS users.

Title: A Model for Adapting Instructional Materials (AIM) for Use in the Education of Children with Exceptional Educational Needs

Author: Jipson-Greenstein, J., Elder, J. K., & Pellow, M.
Region: S-3

Abstract Description: The document describes the AIM process which provided a systematic procedure for identifying products to be adapted; assessing the needed modifications; specifying product objectives; selecting instructional strategies, activities, and media and material characteristics; developing the material; and evaluating the newly developed product.